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LET IT BE.

LET be the river! What does it avail
To struggle with the current's destined course?
The strongest effort does but faint and fail,
Skill yields, out-tired, to resistless force.
The highest rock is overleapt by spray,
The silent waters fret each bar away.

Vainly the bulwark fashioned deep and wide,
New bed contrived, new turn by cunning wrought;
Steady, resistless, onward flows the tide,
Each gathering wave with gathering purpose fraught,
Till, full and free, rejoicing in its strength,
It sweeps to ocean's mighty arms at length.

Let be the river! Let the loved alone
To meet the fate, and shape the circumstance.
We dream the future, fancying all our own,
What does but wait the call of time and chance;
Foredoomed, the path before the pilgrim lies,
The sunset lurking in the morning skies.

Let be the river! Hail its rippling smile,
Listen its song, and shiver to its sigh;
Let its chafed beauty weary hours beguile,
Watch how it darkens to the darkening sky;
We cannot cloud or brighten, speed or check,
Nor alter on its way the tiniest beck.

Let be the river then! Where lilies float,
And blue forget-me-nots beside it shimmer,
Take gladness in its suns' reflected mote,
And soothing from its moonlights' dreamy glimmer;
Happy if still your faltering footsteps tend
Beside its varying currents to the end!

All The Year Round.

HALIDON HILL.

A BORDER BATTLE-FIELD.

A SUN-CLAD slope of living green
Under a cloudless autumn sky —
Say, can it be that this sweet scene,
So bright, so sheltered, so serene,
Once echoed with a battle-cry?

Broad, golden fields of waving corn
Tremble before the wind's soft breath,
While through the air is gaily borne
The reaper's song at early morn —
And this was once a field of death!

No sculptured stone nor marble fair
Now marks the spot where warriors bled;
Only kind spring's returning care,
As though she knew who slumbers there,
Bids her first primrose raise its head.

What though this battle has no place
In Scotland's roll of victories won —
The noblest of her patriot race
Here met their foemen face to face,
And bravely was their duty done.

Stern fate is theirs who, conquering, die;
But his an anguish keener far
Who on the gory field must lie,
And hear the foe's exulting cry:
"Our arms have turned the tide of war!"

Then tenderly let Scotland weep
Over her unrequited brave,
And in her heart their memory keep,
All restfully the while they sleep
In nature's lone and peaceful grave.

HARVEST.

THE corn-land is lying in brief, deep rest,
While tempest is sullen, or sunshine blithe;
Sweet is the scent of the furrow refreshed
After the raid of the pitiless scythe.
Now recks it little — come shower or sun —
The harvest is carried, the work is done.

The jubilant summer has yielded its sway,
And August has lavished its gold on the year;
Magic of moonlight, dazzle of day,
One long laughter with never a tear!
Harvest of happiness, gathered and stored,
Winds cannot scatter the ample hoard.

Awe of the mountain, and calm of the lake,
Mirth of the valley, and sigh of the breeze;
Freedom of upland, and moorland, and brake,
Music of forests, of torrents, of seas:
Harvest of memories, golden and gay;
Fear not for dearth in the wintry day.

Smooth out the seaweed, and dream o'er its spells;
Tighten and tie up the salt-laden tresses;
Little ones, lay by the basket and shells,
Put on the shoes again, turn down the dresses.
Harvest of health, in its happiest guise,
Rosy-brown faces and laughter-lit eyes.

Ah! but the woods in their midsummer green!
Bright with the flow of the musical river:
Shading soft blushes with tenderest screen,
Touched with an echo of voices that quiver.
Harvest of love! Is it anything new?
Should Cupid not gather his harvest too?

All The Year Round.

From The London Quarterly Review.

THE MICROSCOPE AND ITS REVELATIONS.*

THE advance of human knowledge, during the past quarter of a century, has been nowhere so remarkable as in the regions of biology and physics. This has been due in both sciences to the rapid and almost complete perfection to which special instruments of research have been brought. In physics the spectroscope has suddenly wrought a revolution, and almost endowed physical and chemical research with a new sense. Science is only beginning to discover the immense possibilities which this instrument opens up. Already it has, with unerring precision of analysis, discovered the constituent elements of sun and stars; estimated approximately their molecular condition; given evidence of the diverse thermal intensities of stellar bodies; furnished proof of the existence of suns in such a state of heat that compounds have not yet been able to form, of others cooler but still in a state of inconceivable thermal intensity, and of others distinctly cooling. It has been employed, too, to detect what no other means could discover, the actual advance towards or recession from us of great stellar bodies and groups, and to indicate their speed. In the elements that lie around us on our own globe, it has been used to discover new metals which must have eluded all other processes; and to demonstrate the presence of chemical substances in quantities so minute as to be practically non-existent to the ordinary analyses of the chemist.

Scarcely less remarkable have been the rapid perfection and wonderful revelations of the microscope. It is now probably the most perfect physical embodiment of exact abstract science existing. It certainly is the rival, if not the peer, of the telescope in this sense. It almost absolutely *realizes* theoretical optics, and a certain group of mathematicians and physicists, at least, strongly incline to the opinion, which they believe they can approximately demonstrate, that we have reached the limits of power possible by this means: that, in fact, the vibrations of the luminiferous ether are too coarse to reveal minuter objects than those at present reached by our most powerful and refined lenses. Even if this be so — which, from practical evidence, put into contrast with calculations based upon hypotheses, we are inclined to doubt — the resources placed at the disposal of science by this instrument have a value and importance the limit of which no sagacity or penetration is competent to measure. Indeed, at the present time, the finest English and American lenses are greatly in advance of the skill and competence of the majority of microscopists and specialists who employ the microscope. Our text-books are almost silent on the subject of the employment of lenses exceeding in magnifying power a thousand diameters. Yet we do not hesitate to say that at least one English house furnishes an instrument, with almost perfect corrections, which magnifies ten times this amount; but an instrument like this, just as it involves incomparably higher skill in its device and manufacture, so it demands patience, perseverance, and suitable culture, in a far more than ordinary degree, to employ it as a real aid to vision. It cannot be doubted that remarkable results have been attained in the past, in all suitable departments of science, by the use of what are known as "low powers." But these results, which now often astonish the possessors of far more powerful instruments, depended upon the fact that the investi-

* 1. *The Microscope and its Revelations.* By W. B. CARPENTER, M.D., LL.D., etc. Fifth Edition. London: J. and A. Churchill. 1875.

2. *The Border Territory between the Animal and the Vegetable Kingdom.* By Prof. HUXLEY, F.R.S., etc. *Macmillan's Magazine*, February, 1876.

3. *Insectivorous Plants.* By CHAS. DARWIN, M.A., F.R.S. London: John Murray. 1875.

4. *Movements and Habits of Climbing Plants.* By CHAS. DARWIN, M.A., F.R.S. London: John Murray. 1876.

5. *On British Wild Flowers Considered in Relation to Insects.* By Sir JOHN LUBBOCK, Bart., F.R.S., M.P. London: Macmillan and Co. 1875.

6. *Evolution and the Origin of Life.* By H. CHARLTON BASTIAN, M.A., M.D., F.R.S. London: Macmillan and Co. 1874.

7. *The Optical Condition of the Atmosphere in its Bearings on Putrefaction and Infection.* By Prof. TYNDALL, F.R.S., etc. Abstract Printed for the Annual Volume of the Proceedings of the Royal Institution of Great Britain. 1875–1876. And *Nature*, January 27, p. 252, and February 3, p. 268, 1876.

gators who used them did, by incessant labor, make themselves masters of their instruments. It too frequently happens, now, that the purchaser of a good microscope supposes himself forthwith competent to make manifest its utmost powers. But the truth is that there are thousands of "microscopists," possessed of costly instruments, who obtain a reputation as good "exhibitors," but who pass their fine instruments on to their heirs without ever having discovered the full powers of even their moderate lenses. Instead of employing them in original research, and thus discovering their capacities, and devising means, which practice and patient labor are always suggesting, for utilizing them in the most efficient manner, they are content to exhibit brilliantly what may dazzle but fails to instruct, and the qualities of the lens, which only the cunning of practice develops, is undiscovered. But if the users of microscopes, both for amusement and for scientific purposes, do not exhaustively master the use of moderate and moderately high lenses, how can they successfully manipulate and make the best of such instruments as Powell and Lealand's lenses, capable of magnifying from three to twenty thousand diameters? The men who, as true scientific workers, can employ the "one-fiftieth" of an inch lens, or even higher powers, with the same ease as they can a "one eighth" of an inch, or a "one-twelfth" of an inch, are extremely few in England, fewer still in America, and scarcely to be found at all on the Continent. All this arises from a repugnance to enter upon the laborious apprenticeship which their successful employment involves, and without this even the benefit of their employment cannot be seen. Hence amongst the most skilful and competent histologists there is a constant advocacy of "moderate powers," with occasional reminders that the best of work has been done by their employment. Without doubt they have done much, and there remain generations of work for them yet to do. But they have their limits; and that the highest powers now made can, in the hands of practised experts, go immeasurably beyond them, we need only the records of recent microscopical research to demonstrate.

To Dr. Carpenter we are indebted for a concise and thoroughly able summary of these. His "Microscope and its Revelations" is undoubtedly the most complete and trustworthy book which has yet appeared on the whole subject in any language. We question whether that part of the work which details and discusses the results of microscopical work could possibly, in the space allotted, be better done. The matter cannot fail to be interesting to any reader, and it certainly has not suffered in its mode of presentation. But with this testimony of thoroughly deserved commendation, we cannot withhold an expression of regret that this — the best book on the subject — should be silent on the method and advantages of using the highest powers which our opticians can produce. It is only from such a treatise as this that we can hope that the skilful and ardent student, who has mastered the use of lenses magnifying six or eight hundred diameters, will be induced to attempt the use of the highest lenses the optician can provide. But the difficulties must be shown, and, as far as they can be, met in a practical manner; and if this were fairly done, and some of the advantages of high-power research simply illustrated, as they might be, from recent labors in several departments of science, there can be little question that the utmost benefit would accrue, especially in biological inquiries. We would not be understood to imply that Dr. Carpenter should himself have mastered all the detail; the matter for surprise is that he is practically acquainted with so much; but if this part of the book had been put into thoroughly practical hands — been given to men who had specialized themselves as workers with high powers — as the theory and general practice of microscopy has been, it would have given the book a freshness and a real value which, excellent as it is, it does not now possess. It may be added that Dr. Carpenter's beautiful series of illustrations of the "revelations" of the microscope will of themselves not only indicate, but in several instances show clearly the vast fields of

research, and the rich harvest of facts, which are open only to the highest and best combination of lenses which the first English opticians can produce.

The extremely interesting lecture of Professor Huxley, delivered at the Royal Institution so recently, is an illustration in point. He gathers up and summarizes, in his own clear and concise manner, all that is now known of the border territory between the animal and vegetable series. The question is rich in interest from any aspect. What is an animal, what a vegetable? Is there a sharp partition between them, or do they insensibly graduate into each other until they meet, and their continuity is seen? There can be little doubt that such continuity exists throughout organic nature, and it may exist beyond; but before this can be scientifically announced it must have received irresistible proof. To ordinary observation there is an apparent demarcation of the strongest kind between animal and vegetable organisms. The oak, the fern, and the fungus appear to have nothing in common with the ox, the swallow, and the cheese-mite. "But in the fourth and fifth decades of this century the greatest and most rapid revolution which biological science has ever undergone was effected by the application of the modern microscope to the investigation of organic structure; by the introduction of exact and easily manageable methods of conducting the chemical analysis of organic compounds; and finally by the employment of instruments of precision for the measurement of the physical forces which are at work in the living economy."* And the result is that, speaking scientifically, the difference between an animal and a plant "is one of degree rather than of kind; and the problem whether in a given case an organism is an animal or a plant may be essentially insoluble."

The truth is that there is not a single feature belonging to either series of organic forms which is not in some measure shared by some representative of the other.

* "On the Border Territory between the Animal and Vegetable Kingdom." *Macmillan's Magazine*, February, 1876, p. 374.

There are animals, with which every zoologist is familiar, definitely understood to be such, which are so low in the scale of being that they possess no definite form, and reveal to our most refined scrutiny only the feeblest traces of organization; they move, but without framework or muscles, they creep without limbs, they feel without discoverable nerves, they eat without mouths, they digest without stomachs: in short, they have all the properties of life, but without a trace of organized structure.

Because such a creature is ranked as an "animal" we are prone to associate with it a measure at least of consciousness and volition. But, on the other hand, there are plants of the highest and most complex structure, in which delicacy of organization, refinement of mechanical contrivance, and exquisite adaptation of means to ends, are combined with majesty and grace, form and elegance, and even splendor of product; and yet, because they are labelled "plants," or "vegetables," we assume that they are without consciousness, and wholly devoid of will. Do the facts of nature justify such an inference? We venture to think that they go a long way towards making such an inference void.

Let us consider carefully some of the facts. Cuvier relied on motion — volitional change of place — as a feature by which the animal might be clearly distinguished from the vegetable. But the distinction is not true of all animals. The sponge and the corals are made up of colonies of animals as incapable of change of place as the cedar or the sycamore; while the modern microscope has revealed to us a realm of vegetable organization of which individual motion is as essentially an attribute as it is of the eagle or the swallow. The earliest forms of true vegetable life — minute single cells of protoplasm — spend a large proportion of their little lives in intense activity. But when we leave the simple cell, and look upon it as grouped into complex forms, the life-history of such forms is one of unceasing activity. The well-known *Volvox globator* is one of an assemblage of minute plants — common inhabitants of the pond — whose minuteness and beauty of form vie

only with its inexpressible grace and power of motion. It is a minute sphere, elegantly reticulated and covered with fine vibratile hairs, or "cilia," and by their united and harmonious action its motion is effected. At times it whirls like a top upon a rigid axis; again it rolls forward with the combined motions of a planet in space, or darts with almost lightning rapidity across the field. Nothing can surpass the ease and beauty of its movements, and the joyous sense of freedom it suggests. Yet it is a plant of the lowest structure, and millions of them would find an ample ocean in a wineglass.

Not less wonderful and even more beautiful are the still minuter desmids. These are the commonest and most persistent dwellers in our ponds and streams of all their invisible inhabitants. They are a rich green in color, and of every conceivable form: the crescent, the cross, the sphere, the triangle, the straight line, the curve, and every possible combination of them, is to be found in the symmetrical forms of these invisible atoms of beauty. All these delicate plants *can* move; and many of them do so habitually with apparent purpose, and a grace that cannot be surpassed.

But even these are exceeded in minuteness and delicacy of structure by the closely allied *Diatomaceæ*. These differ from the desmids in the possession of an imperishable siliceous skeleton; and although some forms are so minute that twenty thousand of them, if placed between the finger and thumb, would be invisible to the eye and impalpable to the most delicate touch, yet they have lived for such a vast period in the history of the earth that the myriads of successive generations have laid their imperishable skeletons down and actually built up solid rocks. They are found now in every quarter of the globe, in our oceans and rivers, and ponds and ditches, and moist places, from the arctic to the antarctic pole. And these little vegetables — chased and engraved as many of them are with a delicacy which surpasses the analytical power of even the modern microscope — are in many cases free to move, and do so with the utmost elegance and ease.

How such minute atoms of matter effect their unerring and evidently controlled movements, the utmost power of research yet brought to bear upon them has failed to discover. But two recent observers * of the minutest living forms at all amenable to even the great powers of our modern lenses, have demonstrated that these minutest organisms — the bacteria, rod-like bodies present in putrefaction — effect their movements, which are intensely rapid, by means of a pair of motile filaments or "flagella," one at either end of their rod-shaped bodies. Professor Huxley says that "as to the vegetable nature of these there is now no doubt;" and therefore it is extremely probable that some such organs of locomotion might, with sufficient power, be found to belong to the desmid and the diatom. Be that as it may, voluntary motion is as clearly, although not as universally, an attribute of the vegetable as of the animal kingdom.

Nor is it only in minute vegetable forms that this is seen. The exquisite researches of Mr. Charles Darwin upon the habits of the climbing plants have made manifest something nearly akin to "instinct" in their deportment and motion. When a climbing plant first springs from the ground, the extremity of the shoot performs slow gyrations in the air, as if searching for a support, a motion clearly voluntary. The climbing plant twines round its support either with or against the sun. The object is to expose as large a surface as possible to the sun and air, but how the motion is accomplished cannot be determined; yet it is impossible to study the deportment of the whole group of "creepers" without becoming assured of their possession of some almost sentient controlling power. The tendrils of some of these plants coil, others are sensitive to a touch and bend, while others yet secrete a glutinous fluid which attaches it to its support. The tendrils of a bignonia, for example, are sensitive; hence in growing and revolving amid the branched twigs of some supporting tree the tendrils wanting supports soon get touched, and at once they clasp the twig like a bird when perched. The tendrils of another species were seen to slowly travel over the surface of a piece of wood, and when the apex of one of them came to a hole or fissure it inserted itself; the same tendril frequently withdrew itself from one hole to insert itself into another, as if seeking for what exactly pleased it; and Mr. Darwin has seen a tendril withdrawn from a hole after having chosen it and remained fixed there for thirty-six hours. And this apparent selective power is carried still further in some climbing plants of tropical forests, which will travel on, prolonging their growth indefinitely, and avoiding all other supports that present themselves, until

* *Monthly Microscopical Journal*, vol. xiv., p. 105.

they reach the tree which they peculiarly affect, and then they will at once attach themselves. It is not too much to say that the same behavior in a definite animal would be taken as an evidence of "instinct."

But even commoner instances of locomotion amongst plants present themselves. In the deep ponds and watercourses of England the common bladderwort is often found. This plant is usually at the bottom of the pond, its roots immersed in the mud. But it cannot expand its flowers and be fertilized in this position. At the right time, therefore, it rises to the surface of the water, opens its flowers, the pollen is shed upon the pistil, and once more it sinks to its former position.

Yet more remarkable are the habits of the *Vallisneria spiralis*, a plant common in the rivers of the south of France. The female, or seed-bearing parts, and the male, or pollen-bearing parts, grow on separate plants. The female flowers grow on spiral stems, so that if the stream in which they grow should receive an accession of water and rise, by a simple lengthening or pulling out of the corkscrew stem they rise with it; if the water diminishes, by simply compressing the spiral stem they sink with it. Thus they are always on the surface of the water. But the male flowers of the plant grow on short stalks in the water. How, then, is fertilization effected? When the pistils are ripe to receive the pollen, the male flowers absolutely break off, rise to the surface, and, floating round the female flowers, shed their pollen and fertilize the seed. Clearly then motion, and even motion directed to a distinct object, is not absolutely a monopoly of the animal kingdom, and in no way serves to distinguish it from the vegetable.

Not less remarkable is the fact that *sensitiveness* and reflex movement is as strikingly possessed by the vegetable as by the animal world. It has long been known that certain plants exhibit intense susceptibility to external influences. The *Mimosa pudica*, or sensitive plant, is one of these. Not only do the leaflets fold their upper surfaces together, the branches of the leaf-stalks bend to each other, and the whole leaf-stalk falls, instantly, when touched; but if the leaves are only breathed upon, if one of them is touched with a speck of acid, or sunlight focussed upon it by a lens, the same results ensue. Nay, it has been affirmed by Dr. Masters that in the savannahs of tropical America, where this beautiful plant abounds, the vibrations caused by the hoofs of an approaching horse will cause all the mimosas instantly to contract; and, just as in the animal organism a cessation of sensation supervenes, and "numbness" results, from a diminution of temperature, so if this plant be placed in an atmosphere below 15° centigrade all sensibility is gone.

Now, we must no longer suppose that this plant is singular, or in any very remarkable sense an exception. The researches of Charles Darwin and others now prove irresistibly that sensation, or what is a remarkable approach to it, is very widely distributed in vegetable organisms. Nothing can be more remarkable than the sensitiveness or irritability displayed by some plants as a means employed to secure fertilization.* In the common berberry, for example, the stamens lie down upon the petals, and the nectar which the insect seeks is produced by six pairs of honey-glands at the bases of the petals; but the stamens are at their bases highly sensitive or irritable, the consequence being that when the insect touches them they spring forward and throw their pollen upon the intruder, to be carried to another flower. Still more striking is the sensitiveness of a group of orchids, of the genus *Catasetum*. In these plants the pollinia, or pollen-caskets, and the stigmata — the surfaces prepared for the reception of the fertilizing pollen — are in different flowers. Of necessity, then, the pollen must be carried by some active agent to the stigma. This is done by insects, but the adaptations are remarkable in a high degree. The flower containing the pollinia, which is highly elastic, carries it under considerable tension in a part which the insect visiting the flower for nectar never approaches; but in obtaining the nectar the insect comes into contact with a delicate spur, which is so sensitive that the excitement of the touch is carried along the tissues of the plant until it reaches the extremely thin membrane which confines the pollen mass; the membrane is instantly ruptured, the pollinia, with a force that will carry it three feet from the flower, flies out, and, being armed with a gummy disc, it sticks to the insect, which carries it to the next flower, and thus eventually fertilizes the female flower.

In other genera of plants the same means conserve another end. The *Dionæa muscipula* (Venus' fly-trap), for example, is one of the plants which affects

* Fertilisation of Flowers by Insects. Lubbock.

bogs and swamps, and derives but small nourishment, little else than water, from its roots, and is therefore dependent on some other source for pabulum. This is secured by the sensitiveness of the leaf. This organ is bi-lobed; it is capable of being closed like a book. On each lobe there are three delicate spikes, which are exquisitely sensitive. If one of these be touched with a cotton fibre, or even a hair, the lobes snap together like the sudden closing of a book, the act being instantaneous. The object of this is the securing of animal food in the shape of insects, for the *digestion* of which the closed leaf or sensitive trap is specially endowed.

Nor can there be any very remarkable difference in such an organized action in the plant and the animal; for Dr. Burden Sanderson has shown that the same electrical changes ensue in the substance of the plant on contraction, as ensue when the muscle of an animal is similarly affected.

But all this is surpassed by the almost inconceivable susceptibility which the investigations of Darwin have shown to be possessed by the common sundew. This elegant little plant is dependent upon animal food. Its root contributes but little to its support; but the leaf is a beautiful organ for entrapping and digesting food. The insects on which it preys are not secured as in the *Dionœa* by a sudden mechanical action, but by means of a viscid fluid, to which, on the slightest contact, it adheres. The leaf itself is nearly round, and is armed with tentacles crowned with glands, on the top of which the clear, colorless, viscid fluid rests. There may be as many as two hundred tentacles upon a leaf, and each of these is intensely sensitive, and has a power of reflex motion. As soon as an insect alights upon the glands, the irritation is conveyed from tentacle to tentacle, until they have all curved over and directed their glands with their viscid secretion upon the prey, and digestion ensues.

If an insect alight upon only a few of the glands of the exterior tentacles, the results are the same; they become inflected or bent, and carry it with a rolling motion to the centre of the leaf. And this action will be excited by the presence of the minutest insect; nay, by the presence of particles both the size and weight of which are too minute for appreciation. A piece of soft thread, the one-fiftieth of an inch in length, weighing the eight thousand one hundred and ninety-seventh of a grain, and a particle of human hair, the eight-thousandth of an inch in length, weighing less than the seventy-eight thousandth of a grain, have been proved sufficient to excite a tentacle to action, and cause it to bend or arch over one hundred and eighty degrees. Yet it must be remembered that the minute pressure thus so remarkably perceived does not directly affect the gland; but it has to come through the cushion of viscid fluid which crowns it, and on which the particles rest. In fact, therefore, the pressure exerted by the smallest of these bodies does not exceed the millionth of a grain!

But, if so large a particle as the one-fiftieth of an inch of human hair be placed upon the human tongue or in the eye, it is actually unperceived. In sensitiveness, then, the vegetable actually surpasses the most complex and refined animal! But this is by no means the limit of susceptibility in the sundew. Drops of water containing the minutest quantities of organic compounds or ammoniacal salts placed on the leaves, or the leaves immersed in them, produce still more wonderful results. The most remarkable may suffice for illustration. A quantity of phosphate of ammonia in solution not more than the *thirty millionth of a grain*, suffices not only to incurve the whole of the tentacles, but to cause a bending of the entire leaf itself. This is a fact which repeated experiments by the present writer have fully corroborated.

At present the mechanism by which this wonderful susceptibility and reaction are effected is not known. It is one of the problems which await solution with the highest powers of the microscope, and we have reason to believe that it is already fairly attacked. But, in the mean time, it is abundantly clear that if there be a distinction between animals and vegetables, it must be sought outside of the phenomena of sensitiveness or irritability.

Even sleep, apparently so peculiarly a feature of animal organization, is almost as characteristic of the vegetable. The phenomena are caused by the organs which produce spontaneous movement, and the nocturnal position or position in sleep is generally the opposite of that taken in waking. This is specially clear in the *Leguminosæ*. The great water-lily of the Amazons, when it slumbers, closes its gorgeous corolla, and sinks into the water. Almost every flower of the field has its hour for slumber; and in virgin forests, or vast savannahs, the difference

of aspect between the sleeping and the wakeful state is not only unmistakable but impressive.

A remarkably characteristic feature of the vegetable kingdom is the power which the organisms constituting it possess of being propagated by artificial division. A "slip" cut from a healthy plant it is well known will "strike" root in suitable soil, and become a distinct individual. But even this has its counterpart in the animal series. The common *Hydra* of our ponds may be cut into twenty or even forty pieces, and each will become a distinct and perfect individual: if the body be cut into two lengthwise, the parts will become re-soldered, and form a perfect hydra; while, if the dissevered parts be kept asunder, each half will become complete. The same is true of another and better known order of the class. Writing of the *Medusidæ*, or jelly-fishes, Haeckel says, "In several species of the family *Laodicei*, I could divide the umbrella into more than a hundred pieces, and from each piece, provided it only contained a portion of the margin of the umbrella, grew in a few days a complete small medusa." The present writer has *grafted* the body of a *Hydra vulgaris* on to the mouth and tentacles of a *Hydra viridis*, and the blending was perfect, the two creatures becoming one, just as a graft of *gloire de Dijon* will retain its distinctive vitality soldered to a wild-rose stem. Indeed, the records of vivisection, and even surgery, give evidence of "budding" and "grafting" that proves even these to be no distinctive attribute of plants.

Respiration and circulation are both simulated in a striking way by vegetables. The circulation so clearly seen in the web of a frog's foot with a moderate power of the microscope, is a remarkable sight to those who first behold it. But the circulation of protoplasm with its contained chlorophyl granules in the cells of *Vallisneria spiralis* or *Nitella* is as clear, and certainly as striking. On the other hand, there are animals, such as the *Foraminifera*, the *Radiolaria*, or the *Paramœcia*, in which there is either no circulation at all, or the most shadowy semblance of it.

Plants, like animals, may be rendered unconscious by anæsthetics, intoxicated by narcotics, and killed by electricity. Indeed, although a nervous system proper has not been yet found as belonging to any distinctive vegetable, yet there are many unmistakable animals in precisely the same condition. But "the results of recent inquiries into the structure of the nervous system of animals converge towards the conclusion that the nerve fibres, which we have hitherto regarded as ultimate elements of nervous tissue, are not such, but are simply the visible aggregations of vastly more attenuated filaments, the diameter of which dwindles down to the limits of our present microscopic vision, greatly as these have been extended by modern improvements of the microscope, and that a nerve is, in its existence, nothing but a linear tract of specially modified protoplasm between two points of an organism — one of which is able to affect the other by means of the communication so established. Hence it is conceivable that even the simplest living being may possess a nervous system."* Thus, the sensibility of plants, like that of animals, which to our present instruments of research are "without a nervous system," may, in fact, be the result of delicate tracts of nerve substance distributed over the entire organism. Nor does the physical basis of the vitality of the vegetable differ in the least from that of the animal. The protoplasm of both is the same. It was long firmly held that plants were made up of *ternary compounds;* cellulose, dextrine, starch, and so forth. In animals these were said to be subordinate, the body being mainly composed of albumen, fibrin, gelatine, etc. But it is now well known that starch and sugar are always present in the higher animals, whether normal or morbid; while chlorophyl — so distinctively vegetable — has been found in the bodies of the *Stentor* and the green hydra, — which are without question animal — and cellulose, *the* product of vegetables, has been found in the testa of ascidians.

It is clear, then, that no discoverable distinction, which will include the whole of the animal and the whole of the vegetable series, has yet been found; and only one other test remains. It is the nature of the materials assimilated by both classes of organisms. Are they distinct? Must they be of one kind for the animal, and of another kind for the vegetable?

It is here that Professor Huxley finds the "borderland." As a broad generalization it is undoubtedly true that animals depend directly upon plants for the materials of their bodies; that is, either they are herbivorous, or they eat other animals which are herbivorous. On the other hand, plants can work up mineral matters into complex organic compounds. But

* "The Border Territory between the Animal and Vegetable Kingdom," *Macmillan's Magazine*, February, 1876, p. 376.

broad as the basis of this distinction is, it does not cover all the facts. All the higher animals assimilate salt — a mineral — while plants, such as the mistletoe, can only exist on the organic juices provided by the trees on which they are parasitic. But besides this it has now been demonstrated beyond dispute, that vegetable organisms entrap and assimilate animal food; that it is indeed essential to their existence. For fifty years neglected observations have been on record concerning the carnivorous habits of a genus of plants known as *Sarracenia*. There are only eight species, and they are all natives of the eastern states of North America. Like most of the carnivorous plants they affect bogs, and even land covered with shallow water. Their leaves are modified into inverted trumpets or ewers. The flower is solitary. In some of these plants the ewer-shaped leaves are furnished with a protecting lid or cover; in other species, although the lid is there, its position is such that it cannot protect the contents of the leaf. Speaking generally, there is placed at the bottom of these hollow leaves a mucilaginous and somewhat astringent fluid. This has been satisfactorily ascertained by Dr. Mellichamp, from observations upon native specimens in their natural state; though it is rarely true of cultivated specimens in this country. But these tubes are veritable traps for insects. The flying prey are attracted to the leaf, in several instances, by the fact that the cover of the ewer-shaped leaf is colored like the flower. Now the flower contains nectar, which the insect seeks. This is peculiarly the case in an allied form known as *Darlingtonia Californica*. In this plant the cover of the leaf serves as such, and is developed into a long and brilliantly colored flap, marked just like the flower. Further than this, the only openings into the hollow leaf are shaped like the openings into the nectar-bearing parts of the flower. Thus, doubtless, many an unwary fly takes the leaf for the flower; and so far as the object of its search is concerned it suffers no disappointment, for the whole of the cover of the leaf and the rim for some distance down into the tube is richly smeared with honey, secreted by glands specially designed to this end. Once in this rich feasting-ground, the animal is lured farther down. But having reached a certain point the tube becomes delicately enamelled, consisting of glassy cells. No insect can retain a foothold here, so that it inevitably glides down. But the tube narrows rapidly now — wings are useless from want of space — and the body of the insect becomes pressed all round by the narrow neck of the trumpet, which is thickly set with stiff needle-like hairs, all pointing downwards, so that every struggle to be free simply drives the animal down, until, in the cases where it is provided, reaching the fluid which is said to be anæsthetic in its effects, it speedily succumbs. The enormous number of insects thus entrapped is almost incredible. We have carefully watched one of them named *S. flava*, and are convinced that it is a most successful lure. An old leaf cut open will always show the shells and remains of insects, as well as their eggs and chrysalides, pressed closely together for several inches up the tube. We cut recently twenty old leaves from a *S. flava* that had been in the same place for seven years, and had thus become thoroughly "at home," and certainly the number of flies in a recognizable condition, in all the leaves, could not have been less than four thousand; while for some distance at the base of the tubes was a black unrecognizable *débris*. As a rule, in their native state, these plants, in consequence of the animal matter in decay which they thus contain, emit a strongly noxious odor; and there can be no question that the leaves, thus heavily laden with rich manure, fall to the ground and provide the plant with the sustenance which, from the nature of the soil, it would not otherwise obtain. In order to attract wingless insects into these tubes they are furnished almost to the root with a honeyed tract, up which animals such as the ant are lured until they too reach the fatal snare and perish in its depths.

This, it will be seen, is not an instance of the actual *digestion* and assimilation of animal food, although it closely approximates to it. Cases, however, are now well known and carefully attested, in which not only the organ for securing the prey is complete, but the function of digestion is added, so that the plant, like the animal, is supported by animal food. The *Nepenthes*, or true "pitcher-plants," are an instance in point. These are climbing shrubs growing freely in the regions of the tropics. They produce the pitchers, or vase-like appendages, at the ends of their leaves; and these are provided with tendril-like stalks, by means of which the plant can climb. Some of the pitchers are very large and strong, and might even entrap small birds. The rim of the pitcher is richly smeared with honey, and is often attractive in color. The honey-

glands are continued a small distance into the vase, and then the surface becomes exquisitely glazed, so that the insect, attracted in by the nectar, glides down its sides until it reaches an acid fluid contained in the bottom of the vase, into which it falls and is killed.

The glands for secreting this fluid are enormous in number: in one species not less than a million are found in every "pitcher," and, in fact, they are nothing less than stomachs. As is well known, the digestion of albuminous compounds by animals is effected by a ferment called pepsin, which is the active agent, together with weak hydrochloric and lactic acids. And both are essential to the act of digestion. The fluid in these pitchers is a weak acid; and as soon as an organic body is put into the pitcher *pepsin* is poured out in addition, and digestion proper takes place. If an *inorganic* substance be dropped in, *no effect is produced* — the pepsin is not poured out; but if a fragment of beef or mutton, or an insect, be placed in the fluid, precisely the same changes take place as occur when the same substances are put into the stomach of a dog or a man. Nor can digestion be effected by the fluid alone when withdrawn from the pitcher, because then we have the acid only, and the pepsin, which the pitcher would be stimulated to pour out, is wanting.

Darwin has shown the same to be the case with Venus' fly-trap. When the leaf has closed upon its prey, pepsin and acid are poured out in such quantity as actually to fall off the leaf in drops. In this way the toughest insects are digested, and the digested matter is thus transformed into the protoplasm of the plant.

But the same careful observer has shown that even a more striking instance is presented to us in the common sun-dew. It is not only furnished with a beautiful apparatus for entrapping its prey, and a perfect digestive apparatus for the digestion and assimilation of the same to its own support; but it possesses to some extent at least a discriminative power, and can distinguish between what is nutritive and what is not. A piece of beef or mutton, or an insect, placed upon the tentacles leads to their speedy action, and the tentacles do not relax until digestion is complete. But if a piece of cinder, or cork, or glass, or other non-nutritious substance be put upon the leaf, it is probable that no action at all will take place in the tentacles; or if they should move towards and close upon it, they are speedily withdrawn. Mrs. Treat, of America, who has experimented upon them, affirms that not only the tentacles but the leaf will move a minute distance upwards *after* a fly, which is fixed in a position very near to it, but not in contact with it.

In this case, too, the components of the digestive fluid have been most carefully analyzed, and are found to consist of pepsin and acid; and Mr. Darwin has proved it capable of digesting not only raw and roast meats, but cartilage, bone, and even enamel. But digestion may be completely stopped if the acid in the fluid be neutralized by an alkali, or the alkali be rendered neutral by an acid. Thus the analogy is complete.

Hence it will be seen that although it is generally true that plants are characterized by their power of working up mere mineral matters into complex organic compounds, it is yet not true without exceptions, and some of these are significant in a very high degree. But on the other hand, it is simply impossible in the present state of science to prove that in the comparatively unknown "borderland" there are not animals which, with equal facility, manufacture *only* inorganic elements into the life-stuff of which they consist.

During the past four years some carefully digested observations of an exhaustive character have been made upon the extremely minute living forms that people almost the outmost fringe of the area over which our optical aids, as at present provided, extend. The importance of exact knowledge of the whole life-cycle of even a few of these excessively minute organisms is extremely great. Dr. Carpenter tells us that "such a study has recently been very carefully prosecuted, with really important results, by Messrs. Dallinger and Drysdale, who have worked not only with the highest powers, but with appliances specially devised to keep the same drop of water under continuous view."* And Professor Huxley has carefully, and with his usual penetration, applied the information thus afforded to a most critical analysis of the points, if any, in which in this region of minuteness — the last refuge — the animal may differ from the vegetable. His attention was specially drawn to it by the fact that Professor Tyndall some months before asked him to examine a drop of hay infusion placed under an excellent and powerful microscope, and to tell him what some organisms visible in it were. Besides bacteria — the special or-

* The Microscope, p. 494.

ganism present in putrefactive processes — there were other organisms attaining "the comparatively gigantic dimensions of one three-thousandth of an inch." Each of these had a pear-shaped body with the small end slightly incurved, and produced into a long filament of extreme tenuity; and behind this another filament, equally fine, trailed. By lashing the front flagellum, motion was effected, and sometimes it was anchored by the hinder one. These tiny creatures carefully avoided collision when in full career towards each other, and often collected in crowds and jostled one another "with as much semblance of individual effort as a spectator on the Grand Mulets might observe with a telescope among the specks representing men in the valley of Chamounix." Professor Huxley continues: "The spectacle, though always surprising, was not new to me. So my reply to the question put to me was that these organisms were what biologists call *monads*, and though they might be animals, it was also possible that they might, like the bacteria, be plants." To any but the close and critical student of such vital forms, this reply would appear almost absurd; we believe it would have done so to many a well-read biologist a very short time since. We are not surprised, therefore, to find that Professor Tyndall "received this verdict with an expression which showed a sad want of respect for authority." For "he would as soon believe that a sheep was a plant." This led Dr. Huxley carefully to reconsider the subject; and he is obliged to adhere to his former view that it is impossible to determine whether the monad is an animal or a plant.

Professor Huxley was not, however, able to afford the weeks or months required to work out the life-history of this form; but he regrets this the less as the "remarkable observations, recently published by Messrs. Dallinger and Drysdale on certain monads, relate in part to a form so similar . . . that the history of the one may be used to illustrate that of the other." That history is briefly this: — At first the normal, almost oval form divides into two, even to the exquisitely delicate cilium. This was accomplished in six or seven minutes. "At this rate a single form would give rise to a thousand like itself in the course of an hour, to about a million in two hours, and to a number greater than the generally assumed number of human beings now living in the world in three hours. . . . The apparent suddenness of the appearance of multitudes of such organisms as these in any nutritive fluid to which one obtains access is thus easily explained." This method of multiplication by division has, however, been long known as characteristic of such organisms, although the details of the method were never before explained. But a still more remarkable fact is the discovery by these observers, in this and the five other monad forms they so persistently worked out, of a true sexual method of increase. Two of the monads meet, come into contact, and coalesce; the whole of each flowing into the other. The result of the fusion is a triangular body, at first retaining the activity of the component bodies, but at length falling into a state of rest. Eventually the apices of the triangle open, and give exit to a dense yellowish glairy fluid, filled with inconceivably minute granules. These were watched, and seen to develop into the parent form, commence self-division, and once more indeed repeat the cycle.

Professor Huxley says that the form shown him by Dr. Tyndall "very closely resembled" this one, but he is not certain that it is the same. First, because the nucleus or "central particle" described by Messrs. Dallinger and Drysdale could not clearly be made out; and second, because nothing is said by these observers of the existence of "a contractile vacuole" in this particular monad, "though they describe it in another."

We are, however, inclined to think that the form seen by Professors Huxley and Tyndall is identical with that described by those observers. The presence or absence of the "central particle," we gather, can only be determined by very continuous observation at times, and may, perhaps, be dismissed. But on referring to the paper in the "Proceedings of the Royal Microscopical Society," we find that they do describe "a contractile vacuole" in this organism, but not by that designation. It is thus pointed out: "A large disc is constantly present in this stage, and exhibits an opening and shutting motion like that of the eyelid, opening at either hand from a median line, and *snapping* with great force." * This is evidently the description of a contractile vesicle or vacuole having, as in the *Amœba*, some remote relation to circulation or its equivalent; but not being described as usual, might readily escape notice.

This being so, it would appear that Professor Huxley's monad is identical with

* *Monthly Microscopical Journal*, vol. x., p. 248.

the one he aptly uses to illustrate its nature.

Now the question is, Does this group of minute organisms, of which we now have some accurate information, throw any light upon the question of what an animal is, as contradistinguished from a vegetable?

When Professor Huxley wrote his paper in *Macmillan's Magazine*, he had only seen *four* out of the seven papers which we now find Messrs. Dallinger and Drysdale have contributed on this subject. Hence he says: "I am not aware that the investigators from whom I have borrowed this history have endeavored to ascertain whether their monads take solid nutriment or not; so that, though they help us very much to fill up the blanks in the history of my heteromita,* their observations throw no light on the problem we are trying to solve, Is it an animal or is it a plant?" But in the last paper contributed by these gentlemen, we find an extremely instructive passage: —

> We do not profess [they write] to decide what is the true nature of the monads we have studied — that is, to decide whether they be animal or vegetable. We nevertheless strongly believe in their animal nature. But if this be so, they afford another illustration of the inefficiency of the distinction between the animal and vegetable kingdoms, which assumes that animals can only assimilate organic compounds, while vegetables can elaborate their protoplasm from those that are inorganic. We made a series of experiments on the transplantation of known forms to Cohn's "nutritive fluid," which contains no *albuminous matter*, but *only* mineral salts and tartarate of ammonia. The result was that we found that not only the bacteria but the flagellate monads lived, throve, and multiplied in it, although supplied with no other pabulum. If it be affirmed that this is a proof of their vegetable nature, we can only say that the same must be said of the *Kerona* of Ehrenberg and Dujardin, which flourish side by side with the monads, with this nutritive fluid as the sole source of pabulum. And both alike lived and multiplied in the dark.†

Now Professor Huxley shows clearly, that, as to their mode of development, these minute creatures are simulated by definite plants; and there is no reason why they may not be such, save the very cogent one that there is also no reason why they should not be animals. But by the above quotation another fact is presented. A definite animal, the *Kerona*, lives in a purely inorganic fluid *with* the monads, and, therefore, whether the monads be animal or not, it is now clear that animals *can* assimilate purely inorganic nutriment. Thus the last distinction of a scientific nature is gone; and we are obliged to look upon the entire region of biology — the whole realm of vital existences — as without absolute distinction. The continuity is complete; and organically considered, the difference between animal and plant is "one of degree rather than of kind."

This is a generalization to which all the investigations of recent years have pointed. The chemistry of the ultimate substance in which life inheres in both plant and animal is alike; this gives them the same physical basis. It might, therefore, be anticipated that similarity of function would display itself in an almost infinite diversity of manifestation.

But in "Evolution and the Origin of Life" Dr. Bastian would lead us to conclude that because an organic continuity can be scientifically shown to exist, that continuity must be continued from the organic to the inorganic, and that *he has found the link*. He affirms that the minute organisms present in decaying matters originate *de novo;* and that even inorganic, that is mineral, matter suitably combined will give rise to them. Now it is unfortunate that Dr. Bastian is obliged to make the testing ground of his hypothesis a region of organic forms so minute that our most powerful lenses cannot fully reach them, and concerning the life-history of which nothing of real value for generalization is known; while, on the other hand, the hypothesis itself is directly adverse to *all* the facts furnished by experimental biology. We apprehend that there is no man of science and no lover of truth living, who would either reject or wish to refute the spontaneous origin of living things from things non-living, if the facts of nature warranted. But it is too large a question to be lightly treated, and involves too much to allow of unjustified generalization. Nothing can be clearer than the fact that Herbert Spencer, Darwin, and Huxley, for example, would, as believers in the doctrine of evolution, gain much by the *proof* that there was a demonstrable continuity — a visible point of junction — between the now sharply separated organic and inorganic realms. But it is a clear proof of their proverbial honesty that they will not admit the hypothesis upon doubtful data. Dr. Bastian crosses from the

* This is the name Professor Huxley uses in preference to *monad*.

† *Monthly Microscopical Journal*, vol. xiii., p. 190.

organic to the inorganic world, not by the aid of facts, but upon the most transparently fallacious assumptions. There are scores of prominent biologists willing enough to cross from the inorganic to the organic — from the non-living to the living — under the leadership of facts; but it is a fatal feature that, with all Dr. Bastian's almost passionate enforcement of his so-called facts, there is not an English biologist of note who accepts his doctrine.

In the last published volume (the third) of the "Encyclopædia Britannica," * there is a fine article by Huxley and Thystleton Dyer on "Biology." It is there distinctly stated that "the biological sciences are sharply marked off from the abiological, or those which treat of the phenomena manifested by not-living matter, in so far as the properties of living matter *distinguish it absolutely* from all other kinds of things, and as the present state of knowledge furnishes us *with no link between the living and the not-living*." † This, of itself, is enough; it is not a statement of opinion, but of fact. But we have statements of this fact in detail in all the recent writings of competent biologists. And this has greatly exercised Dr. Bastian. He pleads with them as if it were a matter to be determined by their own will. He asks why they should dare to take up a position so adverse to his "facts." ‡ As if the consensus of the finest intellects in Europe specially devoted to the phenomena of life, and knowing all that Dr. Bastian *can* know, were not an answer that makes the very question absurd!

Dr. Bastian evidently prefers what to his mind would be the coherence of the doctrine of evolution to a patient discovery of nature's own methods. To make evolution a satisfactory means by which the inorganic and the organic realms are alike developed, there must be *to his mind* a visible pathway. So he chooses the bacteria-organisms, as we have said, quite unknown, and almost inaccessible to us; and from some undigested and conflicting "facts" obtained by dubious methods, he tells us that the chasm *is* crossed. The bacteria originate spontaneously, originate without parents, in dead matter — and, therefore, evolution is established! In other words, as a recent writer has indicated.§ evolution requires spontaneous generation, and therefore spontaneous generation must be true!

The evidence on which Dr. Bastian relies for his hypothesis is in itself utterly incompetent, even if it were trustworthy. In conspicuous living forms it is not difficult to discover what the mode of origin really is. But in more obscure and less accessible organisms imagination has free scope. There was a time when water-birds were believed to originate in trees! But without any knowledge of such minute and puzzling organisms as bacteria, manifestly peopling in some form air and water, and deposited on every solid, it might be supposed that a scientific biologist would interpret their mode of origin by the mode of origin of all other living things, down to the limit of man's present knowledge, and not attempt to infer from questionable experiments that "spontaneity" of origin which research has gradually exploded and narrowed down amongst organized beings until it can now be assumed concerning no other form *than* the bacteria. Yet Dr. Bastian relies for the truth of his hypothesis simply on thermal experiments on these minute creatures, of whose development we are ignorant. Certain flasks containing them are boiled and sealed while boiling: no air — nothing, indeed, containing Bacteria or their germs — can now come into contact with the fluid. The organisms are said to be killed at a much lower temperature than the boiling-point, so that now if they reappear in the flask they must have originated in dead matter. Now the fact is, that the most careful and precise experiments agree in proving that these specks of organized matter do not survive the boiling-point if the infusion be filtered, carefully boiled, and the vessel carefully closed. But a few very exceptional instances are on record, in which, although the boiling has been continued for some minutes, yet, on the opening of the flasks after the lapse of a suitable time, bacteria have appeared. And it is *only* on the evidence of these "facts" that Dr. Bastian requires that the biological world receive the doctrine of "spontaneous generation"!

Two assumptions lurk in every instance presented to the world by this writer. The first is that a given heat destroys every form or condition of bacterial life: this he has never either proved or taken means to prove. The second is, that in the given instance he had raised every part of a given infusion to this required temperature: a matter needing the utmost caution in a fluid charged with solid matter.

* Ninth edition.
† P. 679.
‡ Evolution, pp. 13–16.
§ *Popular Science Review*, May, 1876, p. 115.

A striking instance of the looseness of the method has recently been presented to us.* Dr. Bastian put an infusion of cress with some of the leaves and stalks of the plants into a flask, and while it was boiling hermetically sealed it, and then raised it to a temperature of 270° to 275° Fahr. It was not opened for nine weeks; but when it was opened the experimenter found "more than a dozen very active monads." He took these and heated them, and found that he could kill them absolutely at a temperature of 140° Fahr. So he triumphantly concludes that they must have originated in dead matter.† Indeed he declares any other conclusion to be in effect absurd, and advises his opponents that their only refuge is to "doubt the facts."

Now, we have seen above, that the monads have recently been most fully and carefully examined, and typical life-histories completely made out. In all the forms studied, after a most rapid and curious series of metamorphoses, evidently all conserving the great end of rapid multiplication, they all, without a single exception, were found to produce myriads of spore or eggs. These were submitted to thermal tests to discover the amount of heat they could bear, and yet develop into perfect monads. It was well established that the creatures themselves were killed at 140° Fahr. or thereabout. But now it was demonstrated that two out of six of the monads produced spore, which developed *under observation*, after exposure to 300° Fahr., and that the average heat-resistance possessed by the spore was nearly double that of the adult.

Now, Dr. Bastian drew, measured, and described his monad — the triumphant product of spontaneous generation — and it has since been absolutely identified as one of the forms whose life-history is now so completely known. It is no other than one of the two forms whose spore were proved to be able to resist 300° Fahr. But since Dr. Bastian only raised his infusion up to 275° Fahr., 25° less than this, it is obvious that his conclusion as to its "spontaneous" origin — so triumphantly and even defiantly flourished before his scientific opponents — is a delusion and a snare. The monads were not parentless waifs, but the natural products of the heat-resisting spore.

But having established the existence of genetic products — eggs — in the monads, the series next in order to the bacteria themselves, and having shown what fallacies may arise from want of knowledge of this fact, we are the more fully prepared to perceive the weakness of Dr. Bastian's method and his inferences. But this is what *he* wholly fails to do; and the same kind of reasoning as was employed to transform a naturally begotten monad into a "spontaneous" product, is now employed — though certainly, whether Dr. Bastian knows it or not, with diminished effect — upon the bacteria.

The most speedy way in which to render futile any further efforts to establish the hypothesis of the transition of not-living into living matter by way of the bacteria would be to demonstrate the germs through which they ultimately multiply. We say ultimately, because they increase at an enormous rate by self-division. But the discovery by the microscope of even the germs of the *monads* evidently taxed the utmost powers of the finest modern microscopes, worked in the most delicate way. It is manifest, therefore, that, since these are comparatively giants to the bacteria, the germs of the latter must be ultra-microscopic. Hence, although they have been indicated distinctly by all the best and most careful experimenters, yet they have never been seen. But their existence was made almost absolutely certain when it was shown that the organisms nearest them in form, size, and deportment produced and emitted germs, out of which the perfect form developed.

The matter must have rested here, so far as our present optical appliances were concerned, but for the fact that Dr. Tyndall devised another method of solving the important problem. It is well known that the passage of a powerful beam of light through a dark room is made strikingly manifest by the presence of dancing motes. The beam is more or less manifest in proportion to their size and multitude. But if the air of any chamber be allowed sufficient time, these motes will deposit themselves upon the lowest surfaces of the chamber, leaving the air clear; so that the intensest beam of light is absolutely *invisible* in its passage across a chamber in such a condition, while the most inconceivably minute particles are capable if they still remain in the air of being made manifest by light condensed and sent in a beam across it.* Dr. Tyndall immed ately saw that this might be applied to the discovery of the presence

* *Popular Science Review*, April, 1876.
† Evolution, pp. 175-180.

* *Nature*, January 27, 1876, p. 252.

or absence of bacterial germs. To put it into practice air-tight chambers were prepared, in which filtered infusions of every kind might be boiled, when, by the passage of a beam from the electric light, it was shown that the air in the chamber was moteless. The result was that such infusions, however long exposed, produced no bacteria. What bacteria and germs they had contained had been destroyed by the boiling temperature; and the surrounding air being deprived of germs or particles of matter carrying them, the infusions were sterile to the end, proving clearly that it was by the presence of germs the putrefactive organism originated; for no sooner were these same infusions exposed to the open air — to the extent of six hundred cases — than they were "infallibly smitten," while in the air freed of its motes there was absolute immunity — the infusions were free to the last.

Clearly then the motes are a determining cause of the presence of bacteria, and it is amongst the least and most densely packed of these particles — immensely beyond the reach of any lens — that Dr. Tyndall discovers the essential precursors of these organisms. Now, the question is, What are they? To suppose they are inorganic is in itself absurd; but it is rendered more so by the fact that calcined air, however much charged with motes, is as powerless as optically pure air to determine the presence of the putrefactive organisms. And, therefore, if what is *known* of the monads as to their ultimate origin in germs be taken beside what is here given, the fact that the germs of bacteria have been reached, approaches much nearer to certainty than many things which even science unhesitatingly accepts.

But even this certainty has been strengthened by an investigation into the deportment of the germs of the monads treated in precisely the same way. This investigation has been conducted by Mr. Dallinger.* The decaying animal matter in which the monads thrive after being in a putrescent state for a year or more may be dried, and becomes then, it appears, a porous flaky mass, friable in many parts, and specifically very light. Now the presence of two well-known monads was demonstrated in a putrescent mass of this kind, and it was seen by careful observation that they were actively depositing germs or spore. The mass was then dried, and heated up to a temperature of ten degrees higher than that required to kill the adult forms, but much lower than was needed to destroy the germs. The fine light powder resulting from the breaking up of the baked mass was then distributed through a chamber, such as Dr. Tyndall used, and an *inorganic fluid* — the "Cohn's nutritive fluid" referred to on p. 77 — which had been shown to be capable of sustaining the monads was inserted, when the beam of light showed that the air in the chamber was full of motes. The whole was then left for five days. After that time had elapsed, the fluids were taken out and examined. The two monads were found to be copiously present in all the cups of fluid. But the air in the chamber was now *moteless;* it had deposited all its particles — this the "beam" demonstrated — so more fluid, perfectly clean, was inserted. At the expiration of five days this was examined, and not a trace of monads was to be found. More dust from the baked mass was now diffused through the chamber, and these sterile cups of fluid again inserted. At the expiration of five days more each of the cups swarmed with monads.

Nothing can be more decisive than this. The germ — known to be such — acted in the production of monads precisely as the motes — *believed* to be germs — acted in the production of bacteria. The inference is irresistible. The lowest organisms known to science are the product of anterior life, and the line of continuity connecting the living and the non-living — spite of Dr. Bastian's hypothesis — has, on the evidence of the most accomplished biologists in the world, yet to be discovered.

This is an important fact. In living matter as such, whether animal or vegetable, there is no sharp line of demarcation. But when we reach the outmost border of the "living," we find no demonstrable connection with the inorganic. That there are lines of continuity from the non-living to the living is in one sense certain, for both states inhere in matter. The living state of matter differs from the dead state in only one essential — the *property* of vitality, a property which by its very nature cannot be destroyed. This property is not found in the proximate principles or constituents of an organized body when dead. So that the property of matter called life results from no known or even conceivable combination of these, but is an entirely new, peculiar, and unknown combination isometric with the sum of them. When this combination breaks up

* *Popular Science Review*, April, 1876. *Monthly Microscopic Journal*, vol. xii., p. 262.

into what are known as the organic elements, that is the act of death. However this property was acquired, it is only matter possessing it that can endow other matter with the same property. Hence, philosophically, we might have anticipated what experiment demonstrates — the non-living and the vital present us with no visible link. The one cannot become the other by any combination or adjustment of atoms, except under the control of matter endowed with the vital property, any more than lead could become gold by any process of the alchemist.

That matter at some remote period in the past history of this globe was endowed with this property is certain. But palpably it was endowed with it once and for all. By whatever process the great Creator wrought out the universe, there was a period when dead matter had to receive a new property — *sui generis* — and, once given, it could no more repeat itself without the same original power acting — whether a "first" or a "second" cause — than inorganic elements can now become organic without the intervention of a living thing. This is true whatever theory of the universe be maintained. It is as true of evolution as it is of the doctrine of distinct and separate creations. There can be no question about this fact. So that when the eager advocate of spontaneous generation urges upon evolutionists that they are bound to believe it if they would be consistent, Professor Huxley properly answers, "If it were so, it would be so much the worse for the doctrine of evolution." * But the truth is that no conceivable mode of origin of the present universe — whether it be projected upon the assumption of either a direct or indirect action of the first great cause — requires to postulate spontaneous generation if it be in any sense logical. There was a period when all conditions and forces, however directed, converged to the endowment of matter with a new — the highest — property, life: and life was the *product* — the "work" done by the forces expended. It was not an indefinite power given to non-living matter to become *vital* when it chose. The conception is absurd. It is no more to be looked for, than that a crystal of quartz should have the power to become a diamond, or a molecule of water to become a molecule of sulphuric acid.

It is clear then that the hypothesis of Dr. Bastian is without foundation, alike in philosophy and in fact. Nature is not capricious; and by whatever means evolution may, under Dr. Bastian's consciousness of necessity, be spurred across the chasm which divides the not-living from the living, he must henceforth abandon the "spontaneous" origin of bacteria.

* Encyclopædia Britannica, vol. iii., p. 689, ninth edition.

From Good Words.

WHAT SHE CAME THROUGH.

BY SARAH TYTLER,

AUTHOR OF "LADY BELL," ETC.

CHAPTER LVI.

RICA'S PRIVATE MISSION.

WHEN Pleasance was back at Stone Cross for the weeks that were left her there, she consented to go through the form of paying a visit to her aunt, amidst the dignities of Gable House.

Such a visit was no pleasure, but a penalty to Pleasance; but she could not in her conscience withhold it, when she took into account that Mrs. Wyndham was her father's sister, and actually, save Pleasance's husband, her nearest surviving relation. Pleasance could not comply even in the most restricted manner with the requirements of society where other recent visitors were concerned and leave out Mrs. Wyndham, without inflicting on her a marked slight. It might even involve a false suspicion on the part of the world of the close, and the neighborhood, that Pleasance accused her aunt of having been in some measure privy to the will which had so long lain in abeyance.

All Pleasance's rampant justice rose up in arms against subjecting Mrs. Wyndham or any member of her family to so unfounded a suspicion. Pleasance would call every day of her life at the Gable House and have the Wyndhams calling every day back again at Willow House, invading her privacy and disturbing her peace, sooner than do them or any other human being such a wrong in cold blood. Pleasance would rather sit half an hour with her aunt and endure the associations which she recalled. The younger woman would look at the elder's slow, pompous movements, and at the traces of the beauty which had remained so long unfaded and unforgotten. Pleasance would listen to Mrs. Wyndham's confidently imperious apologies and excuses in reference to the past, and her labored attempts at promoting greater friendliness for her family's ends in the future. The listener would

endure the speaker's lengthened emphatic dissertations on her children's merits, and her half-indignant remonstrances against, and lamentations over Pleasance's perversity in not grasping at their overtures. She ought to make it her very first arrangement to go to Rome for the coming winter, to live with Nelly in her palace and see the first society in Rome. Pleasance should seek to pick up such a tolerable foreign style, that, on her return to England Mrs. Wyndham and Rica might have no difficulty in taking her up and going out with her. Of course, Pleasance was too young, and above all too peculiarly situated to dispense with influential countenance.

Rica never stayed much beside the mother, who idolized her, so that in consenting to sit with Mrs. Wyndham, Pleasance was at least safe from Rica's more direct assaults, whether of mere flippant levity or reckless importunity. For Pleasance had learned to take the true measure of Rica's hilarity and frankness. But the best-established inferences sometimes fail, so Pleasance was forced to admit, when after doing her utmost to bear and forbear with her aunt at Gable House, she returned home to find Rica established in the drawing-room at Willow House. There she was turning it upside down for her own convenience and amusement, flinging any market flowers with a suspicion of herbs in them out of the window, tossing about Pleasance's books, meddling with and scaring her birds, and inserting the most villanously destructive stitches into a little bit of old and fine embroidery which Pleasance was trying to repair.

"Here you are, cousin Pleasance, and here I am sick to death of waiting for you," the culprit hailed the mistress of the house. "What can you find to say to the poor poky old *mater* with whom you were not such great friends, to begin with? But you had better take a chair," she invited Pleasance to a seat in her own house, "before I open my budget, which happens to be a long and special one. I wonder if I feel like the chancellor of the exchequer when he prepares to lay his before the House? I dare say I am a great deal more in earnest, since, except in the light of his office, he cannot care a straw for what no more concerns him than it concerns the other millions in the kingdom."

"I hope people are sometimes in earnest about what concerns their neighbors. I need not say, I hope, I don't doubt that there are such feelings as philanthropy — even true patriotism," said Pleasance with something between a twinkle and a sparkle in her eye.

"Well, there are such hobbies," said Rica, "and people mount them and ride them to death, pretending all the time that they are disinterested; but what is a hobby, unless a man's way of entertaining himself, and proving his superiority to his fellows? I should like nothing better than to come out as a public benefactress, but then I should always be candid, and own that I did it for a whim and to amuse myself. The new Lady Bountiful, with her woman's rights, her advanced education, and her extended charities, has a good deal of go in her, and is great fun. She is not half such a 'do' to herself, at least, as her predecessor was."

"Do you mean," asked Pleasance, "that you cannot conceive of any real wrongs which any class or section of women may suffer, with redressors of such wrongs, working in the dark and making mistakes and messes, doubtless, but perhaps working towards the light all the same. Do you intend me to believe that you cannot imagine an actual amount of shallow, narrow ignorance which well-instructed people have a genuine desire to lessen? Have you no faith in much patent sore suffering which the friendly souls in the world would seek on the highest authority to relieve? Is it to you an idle play of shams and by-words, assumptions and fashions, of which you can freely make game? Do you see nothing above and beyond the folly of it?"

"Not I," said Rica with unabashed coolness. "But, although I don't believe in saints and martyrs since the time of the apostles, I suppose — and if I had lived in the days of these old gentlemen I dare say I should have had a crow to pluck with them too — still, I have no particular quarrel with the one-idead souls who think they are serving God and man, when they are only airing their own sneaking good-nature and fondness for popularity, or their spite against some neighbor who goes and does the reverse. I think they are worthy enough — a little blind, that is all."

"They are much obliged to you, Miss Wyndham," said Pleasance; for she had never been able to give Rica the right hand of intimacy, in responding to her freedom of address, by calling her cousin by her Christian name.

"What would you have?" said Rica, a little impatiently; "I am a humorist. As

for you, if you cannot see a joke, you should make a pretence you do. Your solemn people, who take everything *au grand serieux*, are too terrible, even when they are not atrocious hypocrites. I do not think I could stand them."

"I used to fancy I could see a joke," said Pleasance, "but to turn everything into a joke is being too much of a light princess to suit my conscience. It seems to me that it is left for the most modern humorists — or those who profess to be so — to put irreverent, unfeeling hands on human nature, as a whole, and treat it as beneath respect, if not beneath contempt."

"Well, so it is," said Rica with a yawn, "there is no great thing in it — I am sure you have lived long enough to find the truth of my words — except that it is mostly good for a laugh. But spare me sermonizing; it ain't quite fair to impose it just yet. By-and-by I shall take my doses, but I need not anticipate the horrible process, need I? I assure you that while I thrust my tongue in my cheek and laugh in my sleeve — you will not be so tyrannical as to refuse me so much liberty — I shall turn out a good, fat, jolly associate sister of a morning, if you make reforming the world your cue, when we keep house together."

"Keep house together!" exclaimed Pleasance astounded.

"Yes, my dear child, that is just what we are going to do," said Rica with frank decision, "and if I were not stupidly honest, I might come over you by hinting that you would do me no end of good. To win such a light-minded, worldly sinner to the side of earnestness, self-denial, and good works would be a grand tribute to your power. But you see I am honest, and I don't hint at having lost my senses, and fallen over head and ears in love with you and your Christian socialism, or whatever it is, though you are very handsome, and have grown rich — at our expense, alas! The utmost that I propose is to make a highly judicious *mariage de convenance* between us two. Seriously, cousin Pleasance, I do not wonder that you have repulsed mamma's heavy artillery of proposals. It is trial enough for me to be tied to her apron-string, and dragged about in her cumbrous, slumbrous way. Then the idea of you going to Nelly, which was so plausible at the first glance, and to which I lent my support, had its disadvantages. You might be gone ever so long, and Nelly and her count might appropriate you altogether, since you have no near tie, or none the holder of which cares to claim it. That is my side of the objection. For yours, the count is exquisitely noble and high-bred, like his palace; but he is as empty of all, save ancestral distinction, as the wide staircase and vast rooms of his dwelling. I have already told you that he is as proud as Lucifer, and as vain as a peacock; he is not easy to get on with. Poor Nelly has her own trials. She is apt to be dismal and occupied with calculations concerning the death of the old count, and she cannot understand why the last should not be as interesting and enlivening to her audience as to herself. Honestly, I think it would be pleasanter for you to stay at home, or merely to travel here and there with me for your duenna, governess, whip — what shall I call it?"

"But I have no idea that I want a duenna or a governess, not to say a whip, whose duties to me I cannot fathom."

"Oh, I should keep in order, fight, and bring recalcitrant members of society to vote that you would not only pass muster, but that you were quite 'good style,'" explained Rica, "as the Parliamentary whips serve their leaders."

"And where would your mother be?"

"Oh, mamma would learn to do without me, as she has to do without Tom and Nelly, as she must do if I can manage to marry to suit me — I make no secret that it is a question of management and suitability. Home is the best place for dowagers, and if mamma is not a dowager, it is all Tom's fault. He ought to have provided me, long ere this, with a presentable, tolerably energetic sister-in-law to take me about. Nelly is *hors de combat*, and I protest mamma makes a spectacle of herself, dragging on some unhappy man's arm, at breakfasts and garden parties, and nodding on her seat during the last waltz after supper," cried Rica in pettish disgust. "As for yachting, she and I together would sink any yacht of light burden; and as for fishing in Norway, or scrambling and roughing it among the Dolomite or any other mountains, or doing anything that one really cares to do, or that is worth doing, it is as entirely beyond her capacity as a flight to the moon. I am always preaching that to sit still is the strength of age, but she will not appropriate the text. Now, you may come in quite handy — you are a matron in name at least, which is all that is necessary. If we can persuade her that it will be for Tom and Nelly's good as well as for mine, I have no doubt that mamma may be induced to depute the care of me

to you, and you to me. I should write to her of course, and Jobbins, my new maid, writes a legible hand, and could keep her still more *au fait*, with regard to our movements."

"And where should we move to?" inquired Pleasance curiously.

"Oh, wherever there is anything good going on. You are a free woman without any encumbrance, as people take care to advertise, but you do not half prize your freedom. To town in the season, of course, for I have had just enough of country society this summer, at Stone Cross, to whet my taste for blood again. Where shall we go — do you ask? wherever there are worlds and men to conquer, to be sure; and it will go hard with us, if with your beauty, money, novelty, and strange eventful history — I am too modest to say anything of my poor little attractions, centring in my tongue — we do not revenge ourselves on Archie Douglas, and take the world by storm."

"But Archie Douglas is my husband; and I do not care in the least for taking the world by storm. Besides, Rica Wyndham, if I were so happy as to have a mother, or even a loving old friend left to me, I should not think there was any pleasure in the world worth being with her."

"Do you mean to say that you reject my suggestion as you did mamma's?" questioned Rica, speaking slowly and seriously, for her.

"Yes, I do, absolutely," answered Pleasance. "I should have said that I was obliged to you for coveting my company, or caring to serve me, only that I might appear to be mocking you, for you have been telling me in every word it was your own greater freedom and fancied better entertainment you coveted, and that it was to serve yourself you spoke."

"Quite so, you are perfectly right, Mrs. Douglas," said Rica, getting up with a laugh which sounded harsh.

Rica's face had till now been looking its best, in its dimpling, rippling laughter, with only the slightest tinge of excitement coloring its ivory hue; but as she rose to go, a purple flush of passion spoilt the delicacy of coloring, and the curves of the mouth were drawn into a sneer which looked bitter and fierce upon a face that was young, and a woman's.

"What," she said, "you can decline every favor we demean ourselves to ask of you, after we forgave your supplanting us in Heron Hill and its wealth, by a base piece of intrigue on the part of your low-minded and cowardly father! But I do not wonder at it, for you, too, have had something to forgive — something that no woman ever can forgive."

"I do not understand you," said Pleasance, standing up stiff and cold, taken aback by the sudden burst of rage and its reviling.

"I mean," said Rica, "that you drew Archie Douglas into a low marriage, which was no sooner committed than it became detestable to him, and which he did his best to ignore and escape from. I mean that he sought his solace in me, that he would fain have taken refuge in a pursuit — idle it must have been since, like your father, he could only have been half a villain — of me and my society; but you, perhaps, because you condemn fine ladies on principle, were not burdened with a lady's scruples of pride or delicacy — you followed and exposed him."

"It is not true," said Pleasance in vehement indignation, but calming down even while she spoke. "You know that you are not speaking the whole, or even the least part of the truth, that you are twisting and distorting facts to suit your own bad purpose."

"I believe, however, that mine is the general version of the story," said Rica, recovering her self-control in part, and smothering the rage she felt in addition to every other ground of offence, at having been detrayed into a rage — for was not her *rôle* that of a laughing philosopher, and did it not detract from her mercurial philosophy to show feeling of any kind? "My theory was held at the time by the persons who should have known best — Mrs. Douglas amongst the rest. If you take my advice, cousin Pleasance, you will have nothing to say to your gentle, enthusiastic mother-in-law when she comes to the neighborhood of Stone Cross next week, that she may be no longer able to avoid making your acquaintance, and when she is so charmed with you at first sight, as to fall into your arms. She has been very fond of you, all along, has she not? stood by you and taken your part? She has not come to you late in the day, when by the shameful misappropriation of grandpapa's property, you are a rich woman? You snubbed poor little Jane Douglas, you know, when she took it into her foolish head to patronize you. But really Jane could do it much more gracefully, for you were only Archie's poor, low-born wife in those days. Archie Douglas has not been particularly strong-minded, honest, and faithful in the course of the his-

tory, in spite of his juvenile heroics. It is so easy to be heroic before the time. However, he has left it to a refined, sensitive model woman, like his mother, to be shamelessly mercenary. Or is it that his objections are insuperable? You should know, since it seems I have given a garbled version of your relations. Do you know you have given me the lie direct; but of course you were in jest — you said you could jest, not a very polite jest, but you despise politeness. It may pass between cousins — only I had better take my leave for the present."

Pleasance was left alone to realize what an insulted woman feels, and to ask herself was this really the world's version of Archie Douglas's conduct and hers? Did the light-minded and ill-natured — and how many people were light-minded and ill-natured in her world! — judge him especially according to this definition?

Pleasance was certain that it was false. She had told herself down at Shardleigh the other day, listening unperceived to his light-heartedness, that Archie Douglas had forgotten her. She had accused him of being cruel and heartless in the completeness of his forgetfulness; but now she indignantly repelled Rica Wyndham's insolent assertion, and told herself that she knew better.

He might have learned to laugh since then, so that she, listening to the light laughter, had said that his love was dead, and he had never loved her. But she had slandered him, and that true love which could never die, and that had once ruled his heart. It must awake, stir, and fill him with vain longing, whenever his better nature spoke to him out of the silence.

Could the world not see the difference between the truth and Rica Wyndham's malicious statement? Could it be that the difference might cease to exist, and that in the course of years, in the void in his heart, and the sense of failure in the life, to which he was sentenced in the middle of his outward prosperity, Archie Douglas would harden, sour, and sink into seeking ever lower and lower compensations, until she who had thought to save him, still more than herself, from the consequences of his folly, would have too surely wrought his destruction?

In addition, was Mrs. Douglas really coming soon to Stone Cross, confirming the report of one of Pleasance's visitors, to mock Pleasance with advances, to bring upon her all the evils of an unsuitable connection, from which she had fled with everything that was hateful rendered positively loathsome by mean hypocrisy being joined to resentful scorn? Ah, how Pleasance wished she could get away from the strife, take to herself the wings of a bird, and flee into the wilderness and be at rest!

CHAPTER LVII.

SPEEDING THE WILLING TRAVELLER.

PLEASANCE was more fortunate than most people, when they desire to go aside for a season, and leave behind them the conflict of their lives. An opportunity presented itself to her at that time to quit Stone Cross and forget her troubles, as she hoped, in the renewal of old ties.

A letter came from Lizzie Blennerhasset, in which the writing, in place of being blurred with the dismay of a false alarm, like Mr. Woodcock's, was all tremulous performing fantastic flourishes with justifiable exultation.

Lizzie had received another letter from Dick Blennerhasset, detailing his rapid rise in the world beyond the Atlantic, and, as if that were not sufficient to swell Lizzie's tender, unselfish heart with gratitude, the letter said a great deal more. Long Dick promised stoutly that he was taking care not to risk the success of which he was so proud, and had entirely left off sprees, when he had no village cronies. He did not seem, thank God, so much as to feel he wanted sprees any more; he was so thundering busy with his forge, his lot of land and his shanty; only he drove his Whitechapel cart every Sunday a dozen miles to the nearest church, not merely to see his neighbors, but to say his prayers, as he had done at home.

But his log house, which he was taking so much trouble with, and his garden which he was clearing and sowing with English seeds, were a thought lonesome. He had taken it into his head that if his cousin Lizzie would come out to him and be his wife, she might cheer him a bit, and give him all that he missed. He did not fear that he could give her a return for what he got, and the two be as happy as the day was long. All that was past was like a dream to him — he did not mean that it could be dreamed over again — but he had begun to think that Pleasance might have been right, since she had not only come of gentlefolks herself, but had found a gentleman for her husband in Joel Wray. As to Joel's thinking light of her, and being parted from her by his friends, Dick could not take that in; he knew a

thing worth two of that. Joel was not made of such miserable stuff; he had been as sweet as man could be on Pleasance. And where could he find among all his grand belongings of fine kin, a lass like Pleasance Hatton?

However, Long Dick was not writing about Pleasance, who had dropped out of his horizon, and in dropping had carried away all the burning pain, and left but the pensive memory of his first love. He had thought that the wild fresh air of these far western woods might do wonders for his cousin Lizzie's health. Somehow he had always seemed to have a special interest, equivalent to a right of ownership in her, since he had saved her life when she was a child. And in the gradual fading and dying out of his passion for Pleasance, he could recall, in his lonely well-doing, nothing so sweet and satisfying as the devoted presence of his little cousin.

To say that Lizzie was acquiescent, to say even that she was happy, was to say literally nothing in the presence of what she felt. Even under all the labor and restraint which a written letter cost to Lizzie, the pride and joy of her heart danced and sung so as to ring through the heart of the reader.

"To think that I d' be to be married at all! I as everybody thought were a owd maid, branded and told off as any shorn sheep, and before Nancy and Kitty, as are well favored, and hale in wind and limb, and as never looked to dance at my bridal, or at my way-goin', which is all the same. Well, it d' sound stammin', kinder hard on en, and I wonder, I do, they bean't more spitefuller than they be at times; but married right off to sich a man! I am to be lady of three cows, not to speak on Dick's pair of hosses; and there d' be a servant man; and us is to drive in the Whitechapel cart — dev you remember driving me, Pleasance? — like gentlefolks or farmers to church on Sundays: but that's nowt to the man. Why, Pleasance, it's not for me to sing his praises not no longer; but you d' know there bean't Long Dick's marrow not in Saxford, nor Applethorpe, nor Cheam, nor in the world! I 'a done nor'n to deserve such a fine lot.

"I'm like to go crazed along on pride, I am; but the thought do keep me down a bit, that he as were evened to you, is only to get a poor silly lameter like me, whose wery passage he 'a offered to pay. But I 'ould not rob him in money, me as is to get all and bring so little to him. I up and towd far'er I could make out part on the passage with my savings in the dress-making, and if he 'ould not give me the rest, to get me off his hands, and well cared for in time to come, I 'ould bide till I could work for the money. At the same time it were not very likely Long Dick, when he came to take second thoughts, 'ould bide by so fine an offer, and, so a grand chance for far'er's own darter — and his poor cripple darter as were not, by no manner on means, every man's bargain — would be lost. Then mor'er, and even Kitty and Nancy, backed me up.

"And so I am to sail in ten days for 'Merika — no less; and if so be you 'ould care to see me once more afore I go, now's the time, for I 'a come to be a lass in request. Folk d' say you mun be growed too grand a lady to care to see me again, or to hear on Dick; but I'll believe none on it of the gal as knew my Long Dick as you knowed he, and as he cared for oon-common, as were nat'ral the days when you were both wanters, and were the likeliest lad and gal far or near.

"And if you d' think on comin', Pleasance, I 'a spoken to Missus Gooch as 'a taken Missus Balls's place up in your owd house at manor; and her is a quiet, purpose 'oman, and says they 'a a room and to spare, and 'ould not objec to a lodger for a week or thatten."

It has been said no woman hears that a man who has once loved her, is consoled for her loss, and has replaced, or is in the act of replacing her by another woman, without a little recoil of mortification and displeasure. But Pleasance only thought, "If Archie Douglas has forgotten me in part Long Dick may well have forgotten me altogether."

"I will come, Lizzie; I shall see one woman under God's sun perfectly happy. I shall get away from Stone Cross, from society with all its claims, from mocking mischief-makers and furious assailants like Rica Wyndham, from the speciously bland apparition of my mother-in-law, to something simpler, ruder, truer. I shall return to the folk of Saxford whom I know, to Lizzie whom I love, and who does not in her day of triumph bear me a particle of malice because I was Long Dick's original choice, but has love to spare for me even from the huge mountain of love that is his due.

"I have the advantage of being free, as Rica Wyndham said. There is some good in being a woman of independent fortune, after all. I shall write to Mr. Woodcock. I am afraid he will disapprove; but I must vex the friendly old gentleman on this occasion. There is no help for it, that

'the nest is flown,' and the bird has gone back, with her clipped wings and encumbered feet, to the spot of earth whence she took flight."

Pleasance was as good as her word, and arrived at the nearest station to Saxford within several days of Lizzie's sailing. Pleasance did not take a cab, like Mr. Selincourt, when he was on his mission of inquiry, and was forced to invade the precincts of the Brown Cow. She did not come down in style and impress her grandeur on the natives, as they had predicted she would do from the moment they had heard of her expected arrival. She walked to the manor-house, as she had walked from it, though she left her luggage, rendered more bulky by special marriage-gifts — a travelling-suit to Lizzie — the last improved set of harness to Long Dick, and by sundry other gifts to old acquaintances and allies. And Pleasance wore her plainest striped calicot morning-gown, the nearest in material to the old gowns which she had worn when she was a dairy-maid, deputy housekeeper, and farm servant under her cousin at the manor.

It was just about the equinox when the bare pastures and the abounding water of the east country were being scoured and tossed out of their last remnant of summer verdure and tranquillity.

The manor-house had undergone changes since Pleasance had quitted it in early spring. Its yellow walls had been subjected to a process which had removed its weather-stains and restored its pristine ochry hue in somewhat glaring contrast to its wavering, bulging out, sunken-down outline. A great part of its old olive thatch, with its luxuriant houseleek, had been removed and replaced by new bristling straw, hard in outline and pale in tone.

At the lattice window, instead of stout, hearty Mrs. Balls, there looked out the quiet "purpose," Mrs. Gooch, a young, thin, hesitating woman, shrinking from the responsibility which she had incurred. She curtseyed to Pleasance, and did not usher her into the great kitchen, where Anne and Pleasance had once done their best to fill the two oaken chairs, and round whose walls Pleasance's crows' scratches of drawings had been wont to flutter. It had long been her home, but it had ceased to know her, and she ceased to know it as the house-place of Joe Gooch, his missus and family.

Pleasance was shown — she could no longer take it upon her to walk where she would — into the best room, made up of cast-off relics of ancient gentility, and of out-of-keeping, coarse bits of modern Cheam upholstery — the room which Pleasance had always avoided as the least habitable and likable room of the manor-house.

Pleasance had a meal there — no longer of souse cheese, apple turnover, cyder and ale, but of a slice of stale, shop-bought cake, with a glass of sour wine. She found it discomposed Mrs. Gooch, when Pleasance crossed the threshold of the room assigned to her. Mrs. Gooch, and even her husband, could by no means comprehend, but were inclined to be suspicious — though they were themselves honest people enough — of Pleasance's eager interest in the farm-stock and of her impulse to go and greet every animal that had been there six months before. "She be in Lawyer Lockwood's interest; she be here to report any shortcomings; you never oughtn't to have had her here; 'ware on her, missus," was Joe Gooch's warning to his missus.

Pleasance had to put up with the altered lines in the house and its inhabitants — with the oblivion into which she had begun to fall where the bucolic, equine, and canine memories of Daisy, Dobbin, Growler, and their compeers were in question.

She was the sooner reconciled to it, that she felt with a mixture of proud regret, of half-sorrowful diversion, and nascent unconfessed hopefulness, that there was a change in herself. The little world of the manor farm could not be to her, any more than she could be to it, what it had been. She had gone beyond it; her bands were enlarged. The place no longer fitted her, nor she the place. It was like her own image in Long Dick's mind — a vision of the past to be fondly remembered, but to be left behind.

She stood in that room to which regard for the Gooches' feelings confined her, and looked out with the greatest interest on all the operations in which she had once taken so prominent a part, but with no great desire to resume them. She felt as if she had engaged in them in another state of existence and another world.

It was the same in her intercourse with the natives of Saxford, always excepting Lizzie Blennerhasset. Upon the whole, Pleasance thought the villagers — the girls — took it less amiss that she should have been carried back to her natural sphere, by Joel Wray's doing her justice in money matters, or by her coming into a fortune — they were not at all particular which —

than they had regarded her presuming to wear spectacles while she stood in the rank of a working-girl. But they were shy of her, while interested in her, as the better specimens of the poor people of Stone Cross had been shy.

True, in this instance the shyness wore off a little, and the girls got the length of asking Pleasance, and of listening with curiosity to her answer, what she did when she was no longer called upon to dirty her fingers. They required a catalogue of her wardrobe, were amazed and a little scandalized to find it no finer than it was, but were greatly pleased when Pleasance showed them a new fashion and offered them a pattern. Still, it was as impossible for Pleasance and them to go back and reoccupy the old footing, as it was impossible to gather up the drops of water which had flown miles in their progress to the sea, and restore them to their place at the source of the brook.

Only Lizzie Blennerhasset, with Anne and Mrs. Balls in their graves, remained the same as ever to Pleasance.

Great joy, like great grief, smooths out artificial distinctions. Lizzie in her exaltation could not realize that Pleasance had been removed from her sphere. And where there was no realization there was no removal.

So far from Lizzie feeling that Pleasance was raised above her, Lizzie, in her glory of rewarded, satisfied love, recognized that Pleasance had suffered a great, irremediable loss, and was far below her old companion whom she had helped and favored.

What was Pleasance, the grand lady living in alienation as Lizzie comprehended by instinct, from Joel Wray — though Pleasance never said a word — to Lizzie, the thrice-happy bride of Long Dick? Lizzie intensely pitied Pleasance, to whom she was stooping; she almost reproached herself, only Pleasance encouraged her, for pouring out, as Lizzie poured, her bliss in Pleasance's ears.

The strain rang always with the same changes. Who would have thought that Lizzie would have been married at all, and to such a man — Lizzie's king of men! Not as she had once been fain to crave when he was worn and worsted, soiled and beggared of all that men and women prize, but while still in the flower of his youth, in his conquest over his lower inclinations, in that worldly victory of which men approve so highly under the name of success. Even Lizzie's cool and but slightly sympathetic neighbors readily owned that the girl's luck had been prodigious.

Pleasance was wrong in begging Lizzie to say no more of her — Lizzie's — unworthiness, because it moved Pleasance strangely, and brought the tears to her eyes to hear it, since it was a safeguard to keep the fragile human heart from bursting, as it has been known to burst under a mighty flood of happiness. As it was, Lizzie's health had never been so good as on the eve of her voyage and marriage; a little color flickered in her cheek, her blue eyes were bluer and sweeter than ever. Pleasance even fancied that, by dint of sheer happiness, Lizzie limped less, or else the limp was less perceptible.

It was a small matter to quit her parents who were pleased to get rid of her creditably, who had never taken much heed of, not to say pride in her, till now, and whose very pride at present was mingled with doubtful apologies. She did not mind parting from her sisters, with whom she had little in common — even from Clem, who had his music at last to his heart's content, and needed her no longer — or from Pleasance, who had become again outwardly the lady that she had always been inwardly. Nothing was any trial worth speaking of to Lizzie Blennerhasset, when it was counterbalanced by her going a thousand and odd miles to marry her cousin, Long Dick.

> Across the hills and far away,
> Beyond their utmost purple rim,
> Beyond the night, beyond the day,
> Through all the world she'd follow him.

Although Lizzie had never been on a sheet of water bigger or more exposed than the Saxford Board, while she had seen the sea and heard of its wild work at Cheam, she was not afraid to propose, in the middle of a raging equinox, to cross an ocean, a sickly little steerage passenger, alone, unprotected, save by her very weakness, in an unruly crowd, to reach Dick. The discomforts and hardships of a voyage, however prosperous, even to a homely girl like Lizzie, would pass lightly over her, in her long ecstasy. Doubtless, she would entertain all her fellow-passengers who would listen to her, for the whole length of the voyage, with tales of her matchless felicity and her grand man. And the strangers would listen and marvel, and laugh in her poor little face. They would ask each other if she were crazy, or if some rascal were taking "a rise" out of her, so that she would find him gone out of sight and sound, or married to

another woman when she arrived — till the last moment, when they might chance to see Dick, stalwart and faithful, ready prepared with a tender welcome.

Lizzie would have been willing to pass again through fire as well as through flood, to attain that bourne.

Pleasance became familiar with the end of the story in anticipation, until in a short time it ceased to fill her imagination, which would stray irresistibly to her own affairs and those of Archie Douglas.

It was a bad choice that Pleasance had made of a place to forget herself and him in. She had come back unwittingly to the very locality where their short, close connection had its beginning and ending. Every spot was associated, not only with the tranquil years which had succeeded the one great tempest of Pleasance's youth, but with the halcyon days of Joel Wray's coming a poor stranger and day's man to Manor Farm; of their working together and knowing each other as if by intuition; of his swiftly developed, openly-shown preference and frank, fearless rivalry with Long Dick; of his wooing and winning her, up to the disastrous exposure in the church, and the bitter parting which followed.

Why had the love, so much more spontaneous and equal — after all been so much less fortunate than Lizzie's one-sided worship and her cousin Dick's mild liking? Was the contrast between the two women's experiences a case of Dives and Lazarus? Had Pleasance's and Lizzie's gifts, their good and evil things, been apportioned in the beginning to be reversed in the end?

It was close upon the very season of Pleasance's wedding only a year before, that season whose sober and chastened charms Archie Douglas in the wilful and headstrong passion of his youth, had been able to teach her fully to perceive.

How kind he had been then, not only in his keen sympathy with the shipwrecked sailors at Cheam, or in the first devotion of the love which she had accepted and returned, but in his patience with the obligations which she had asserted, and his indulgence to her partialities and prejudices.

These arrangements had been but a makeshift; he had been consciously deceiving her all the while. Therein had lain the fatal flaw. But he had been so eager to spare, so reluctant to thwart, so fain to gratify her to the last moment, when concealment came to an end, and when she had repaid his wistful breaking of the blow with unmixed scorn and reprobation.

That girl of whom he had told her, in the play, — that beautiful, ambitious girl whom the gardener lad had wedded under the guise of a prince, though she had met the discovery with furious revilings, had relented, after it was too late, indeed, but still long within the proverbial year and a day. Had she been less upright, or had she been more loving than Pleasance? Was it true, what he had said, that she had not only been unforgiving, but that she had suffered the accidents of fortune, which he had refused to count where she was concerned, to come between and part them? — that she, the poor woman, had shown herself more influenced by the world in the end, than he, the rich man, had proved in the beginning? And by her incapacity for forbearance had she forsaken the man whom she had chosen as he had chosen her, — failed in her obligations and her solemn vow, and left him to struggle and to perish as he might in the weakness of his error?

Was death more sacred than life? Would she have gone to him for a brief reconciliation and a passing satisfaction, and would she continue to stand aside and let two lives be wasted? Within the sight and sound of Lizzie's primitive bliss, primitive passions took larger proportions.

Pleasance turned from the ceaseless wearing reiteration and discipline of these questions to go with Lizzie to Cheam, to see her on board the ship, and be the last of her friends to leave her.

Lizzie's happiness underwent no cloud; the dull October evening was a June morning to her; and the tar-smelling, confusion, and noise on the deck of the emigrant ship was already Dick's white-washed house in the lone green woods. Notwithstanding, she was touched by the assiduity of Pleasance's friendship, and she suggested, —

"Happen you'll come out and pay us a visit, Pleasance — you, who are your own mistress, and 'a more money than you can spend, else I 'ould never 'a let you spend so much on me. Dick and me as are one now, eh, we 'ould be mortal glad to see you out there. Or happen we'll come back and see how all you owd folk d' be farin.'"

To Lizzie, in spite of her modesty, Dick and herself, in their approaching honeymoon, were invested with a kind of perennial youth, in keeping with the new and fresh land in which their lots were cast. The people and the world she was leaving behind her, were alike old and faded — to

be regarded with gentle patronizing toleration and pity, which in a less meek little woman would have been allied to contempt.

"There is something to come before that," said Pleasance. "Dick will have word of the arrival of the vessel, and be in the port waiting for you."

"I hope not," answered Lizzie seriously, "if there be his hay to take in, or his patch on corn to sow, or his cows ailin', or any press on hoss-shoein'. Whatten for should he take the trouble? Arter I 'a gone so far alone, I can go a bit far'er, it stands to reason. And I should not like to begin by burdening he, that 'ould be a bad, oonhandsome, and ooncalled-for beginnin'."

"How should you like to find him then? What circumstances would you choose for those of your meeting?"

"Wool, I 'a no peticklер choice; if so be hisself is there, anything will do famously," said Lizzie brightly, as she looked with dazzled eyes over the side of the vessel, out to the heaving, moaning sea, and not back to England. "Tell 'ee what though, Pleasance, I mean to lay up the pretty gownd, cloak, and bonnet you 'a gin me to travel in — anything is good for salt water and ship's company, Dick not bein' there. I'll put 'en on spick and span the day we land, for I 'a a fear sometimes, though you are good enough to say 'appiness d' be main settin', Dick mun 'a forgotten my looks, my limp and that; and I 'ould giv' en all the help I can for the first day. Arter that — wool, I can lay my hair among 's feet to prevent him ever mindin' he were that generous and kind."

"He'll never rue it, Lizzie, nor will you."

"I? I dessay not," exclaimed Lizzie in laughing disdain. "I 'a been born under what folk call a lucky star; and its luckiest shinin' were when our 'owd smithy went on fire, and Dick — he thought on me, wakened me up, and carried me out with the stair cracking aneath his brave feet. I remember, that I do. Tell 'ee what, Pleasance, I should like just to find Dick a-sleepin' soun' hisself, that he should a-waken up and fin' me in his own house-place, with nobody but our two sens to see. I think he 'ouldn't be disappointed then — not as if he 'ad been a-waitin' and a-watchin' with folk a-speakin' and a-twittin' him about his gal."

CHAPTER LVIII.

PLEASANCE DOUGLAS'S OBLIGATIONS.

PLEASANCE struggled a little longer with the gall and fret of the obligations to which she was gradually awakening, and which the sight of the manor-house and of Lizzie Blennerhasset's willing feet starting on their loving pilgrimage, quickened to tormenting activity. Then Pleasance yielded to the compulsion which was on her, and took another desperate resolution, carrying it out in her uncompromising fashion.

She did not write and ask the advice of her friend Mr. Woodcock; she did not appeal to Mrs. Douglas, who, as she had been told, was now much inclined to play the part of peacemaker; she did not solicit the more unsophisticated kindness of Archie Douglas's sister. These were the old *bêtes noirs* of Archie's friends and kindred, whom she would face at the proper time and place, but she would never seek their help. Pleasance would have no go-betweens, no mediators between her and Archie Douglas.

She left the manor-house where she had still lingered, and travelled straight across the autumn country to Shardleigh. She passed through the same woodlands that she had traversed in early September, when she had come from Stone Cross, believing Archie Douglas lying near to death in his house. The sombre monotony of the late summer green, had been broken up by October into a splendid wealth and variety of color. The beeches were red gold, the chestnuts yellow gold, the hedge-maples straw color, the oaks tawny, while the ash had regained, in fading, a vivid apple-green. Where ornamental trees of foreign origin had been recently introduced into some of the gentlemen's parks which she passed, the sumach was a flaming crimson, and the last imported oak a royal scarlet. The bracken seen between the trees was a rusty brown or a pale maize. Pleasance was sure that there must be a new spell of life in the woods after the slumbrous pause of overblown summer; acorns and chestnuts must be dropping on every side, rabbits and hares must be scudding, squirrels leaping, and little robins trilling from bough to bough. It was the Indian summer before the nightly frosts grew sharper and more biting; before mists gathered earlier in the evening, and lingered later in the morning, and the branches stood picked out in their thinning leaves, and waxed barer and barer — till what with the mists and the darkness, wanness, and greyness contrasting with the black-green of such foliage as was left, brown October waned into a chill, shadowy forerunner of the dreariness and deadness of November and December.

It was still far from the desolation of the year, and Pleasance, spurred on to a great effort at self-abnegation, to an entire yielding up of her will, and a full atonement, took some comfort from the beauty which was born of rough wind and weather, of icy frost as well as of genial sunshine. Pleasance did not go to Westbrook this time. There was not a prince every day at Westbrook to divide and distract public attention, and coming deliberately, as it were, of her own free-will, knowing her purpose, Pleasance shrank more than ever from observation, and seemed to apprehend detection in every encounter.

She travelled by a slow train, and came out at the little Woodgreen Station, near the farmhouse, where the gentleman who had suffered from the accident had lain for several weeks.

It was too late to go further that night, and Pleasance, asking where accommodation could be had near at hand, was referred to that very farmhouse, and permitted to lodge in the same rooms where Archie Douglas had watched. She was entertained, as a matter of course, by the farmer's sister, who served her with the great story of the gentleman's accident, danger, sufferings, and recovery, and the attention paid to him by the squire. The chair which Archie Douglas used to occupy during the watches of the night was pointed out to Pleasance. When she was alone she went and sat down in it, and leaned back her head, with her eyes fixed on the bed, saying, "So I might have sat here, and he lain yonder." Then she started up in fright lest her senses had forsaken her.

In the morning Pleasance found on inquiry that there was a little pony-carriage kept for the farmer's old mother, and which she might have for a consideration to the boy who drove it, to take her over to Shardleigh.

No one wondered that after she had been ciceroned to the corner of the field where the gentleman was accidentally shot, she should go on to Shardleigh, the show-place of the neighborhood. With Westbrook and its abundant railway opportunities in the immediate vicinity, there seemed no occasion for her to return to Woodgreen, and its little station, where few trains stopped.

Something in Pleasance's beauty, her independent mode of travelling, and perhaps, — who knows? — an utterly unconscious tragic element in her simple speech and manners at this time, put it into her last hostess's head that the stranger was "a play-acting lady," wonderfully civil and quiet for her kind, connected with a company of actors in the neighboring town.

Unaware of the inference, which she would not have heeded had she guessed it, Pleasance, in the intensity of her determination, stepped "like a queen" (albeit a stage-queen, to the mind of her hostess) into the little carriage. She was driven along the pleasant shady road to Shardleigh, up to the great old stone gateway, old and stately enough to dispense with armorial bearings.

The lodgekeeper threw open the gates, as it was a public day. When Pleasance dismissed her little curricle and driver with his gratuity, and announced that she meant to walk up the avenue, the woman prepared to chat affably with the newcomer, to tell her the points of interest in the views of the house and conservatories, and to indicate the special groups of trees which she was to look at on the road.

Pleasance interrupted the speaker to ask briefly if the family were at home.

Yes, some of the family were staying at the house, but that made no difference, not the least in the world, on a public day. "I hold the place on trust, don't you know, Jenkins?" the squire had once said to the lodgekeeper's husband, when, as under-gamekeeper, he had objected to visitors straying as far as the head-keeper's cottage, and disturbing the young pheasants, "and I wish I could give the public more enjoyment than they get in Shardleigh." "Them were the squire's very sentiments, and his father's before him," the speaker continued to recount. "Of course visitors don't ought to go and abuse such kindness, picking and stealing flowers, and disturbing any game as is about."

Pleasance only responded to the hint, if it were meant for her benefit, to respect her husband's property by saying, "Is the squire ——" The word spoken by her sounded so strangely in her ears that she stopped and began again, "Which of the family is at home?"

"The squire himself," the woman answered promptly, and Pleasance's heart gave a great throb; she could not have told whether of thankfulness or reluctance.

"But he is going to-morrow for a great way, and a long while, th: more's the pity," the servant volunteered the information.

Pleasance was silent, considering how nearly she had missed her object.

The lodgekeeper liked a gossip. She

had by this time made up her mind that she would pay the handsome, solitary lady who had come so early, the compliment (the squire liked the visitors to be attended to) of strolling with her as far as the road which turned aside to the offices, where the woman had, or imagined she had, business with half-a-dozen satellites. Her little girl "Hemmar" would look to the gate, as well as her mother could, in her absence. The squire objected to fees paid to his servants, but he was not the hard-hearted gentleman to find fault with pence chucked to a child.

If Pleasance pleased, the lodgekeeper would take her the length of the sycamores, which were older than the house, and the stone-pines, which had been planted by the former family.

Pleasance could not choose but please; and as they walked, she kept asking herself where her feet were carrying her, and getting giddier under the knowledge, while her companion furnished an under-current of monologue by way of conversation, out of which Pleasance caught snatches of information that nearly concerned her.

The squire was going away as far as Queensland, if the lady knew where that was. The lodgekeeper was aware that it was a deal further off than France or Italy, where Mrs. Douglas had often gone for her health. But it was nothing that the ladies of the family should not make any stay at Shardleigh — the neighbors and servants were used to that; and as it happened this year, Mrs. and Miss Douglas were gone to pay visits before meeting the squire in London to see him off, after which they were to try wintering at Torquay. But everybody had depended on the squire's remaining at home when he was done with his college and his travelling, and since all connection had been broken off with the great Lancashire mills on his father's death. His mother was not the least disappointed of all at this last flight; she had done what she could to prevent it, and she quite "took on" about it. So fond as the squire had been of the country when he was young, too, and so little as he cared for a fine gentleman's life in London. People had hoped that he would have stayed still, though his misfortune, which was not connected with the place, prevented him settling in life as he might have done.

The speaker caught herself up, and broke off her confidences for a moment. With all her communicativeness, she was too well disposed and honestly attached to her master to desire to impart the slur of the squire's unhappy marriage to a stranger.

Pleasance need not have kept her eyes riveted on the ground, and felt her cheeks begin to burn, in anticipation of a repetition of the farmers' talk in the railway carriage six weeks before.

She could tell — the lodgekeeper hastened to resume the one-sided, and, on that account, all the more enjoyable, conversation — why the squire had fixed on Queensland for his present destination. He had a friend — one of his many friends, whose father had been made head man of some sort (governor it was called) of that end of the world, and the squire he would go and help him and his son. The squire was mad to help to govern, to see after the emigrants who sailed there, and to find whether it was a good settlement for any poor bodies who could not get on at Shard Common or in Westbrook. It was like the squire, and his going might be of service to many, the woman owned; but it was disheartening to the folk at home, and the servants at the house — she for one, would miss him. He had always been coming and going, with a pleasant word for everybody, and an interest in everything. He overweighted himself with interest. Only this last night there had been word of poachers about; and though the squire might have trusted Warwick, the head-keeper, who had been in the place before his master was born, and her husband, a keeper's son, bred to the work, nothing would serve the squire but he would go with the men to hinder mischief, and speak the rogues fair in the first place, if the gamekeepers fell in with their enemies; but of course the prowling scamps took good care to be out of the way, when they were sought for.

The guide had forgotten to point out to Pleasance the sycamores and the stone-pines, and she was at the road which led to the offices, where she turned off with a parting assurance to Pleasance that she could not lose her way. She had only to hold straight on, when she would have fine views of the house and conservatories. Just as she was close upon them, she would come to the laurel walk, which would lead her to the south garden door, and there one of the under-gardeners would be sure to be in waiting.

Pleasance did not think it necessary to say that the laurel walk and the gardens, even the winter garden, had no place in her plans.

She walked on alone through all the stateliness, beauty, and sweet scents of an

old avenue of fine trees, in one of the two seasons of the year when such an avenue is most attractive. The flowering shrubs of spring had put on their wealth of berries, which the birds had not yet plundered. The gloss and bloom, and subtle or splendid tints of these berries were hardly inferior to the loveliness of the flowers, while the glory of the leaves could be compared to nothing save that sunset glory which is too beautiful to last.

Pleasance walked along as in a dream, with a dim sense of harmony and grace all around her; but she failed altogether to mark the fine porch, after Inigo Jones, which was the pride of Mr. Woodcock's heart.

The hall-door was standing open, and as she put her hand on the bell, the butler, who was crossing the hall, came to her.

"There is no order required for seeing the gardens on Toosdays, madam," he told her courteously, before her lips could frame a question.

He was a stout, elderly man in an undress of grey, instead of the "cloth" of his order, and looked more hearty and less solemn than butlers generally look. He struck Pleasance with a passing, ridiculous sense of acquaintance, from a slight resemblance which he bore to the manor-house bailiff.

As he stood, speculating what she wanted farther, and feeling disinclined, though he was an obliging man, to go out, and that on an October morning, in his slippers, only to take one of the already sufficiently indebted public — even a handsome young lady — round to the gardens, Pleasance managed to say in a low voice, "Can I speak with Mr. Douglas?"

Then he concluded that she had some special favor to ask of the squire, perhaps had brought a letter of introduction, though it was odd that she should deliver it in person, betimes of a morning. Only ladies were learning to do their own errands nowadays, and were less mealy-mouthed than they were formerly.

"Will you walk in?" said the butler, following up this idea, "till I send some one to inquire. We were late up last night; indeed, I do not know if Mr. Douglas went to bed at all, or if he has not lain down now."

He did not explain why the head of the house had been at large during the small hours. Probably, though he was remarkably free from official pride, he had a conventional prejudice that it would be more to Mr. Douglas's credit as a gentleman, and less to his discredit as an eccentric, rich democrat, to let it be supposed that he had been racketing the night away.

Mr. Debree took Pleasance to the library, and after glancing round, showed her in, and shut the door behind her, while he proceeded to look up a footman to look up his master.

Pleasance stood for a moment staring in her agitation at the bookcases, with their volumes and busts, the long table covered at this moment with maps, the chair standing empty before it.

Something, she could not tell what, made her turn quickly round the next moment, and there on a couch behind the door lay Archie Douglas with his arms above his head, fast asleep, undisturbed either by the opening door, or a presence he little wotted of.

The very circumstances which Lizzie Blennerhasset had idly projected in the height of her happiness, as those in which she should choose to meet Long Dick in the backwoods, were those in which Pleasance found Archie Douglas at Shardleigh, in the midst of their trouble, and while she was altogether uncertain what his awakening might bring forth.

Archie Douglas slept, and Pleasance held her breath, to feed her famished eyes on the traits which had been and were so dear to her. There was no chance of his offending her with his levity and indifference at this moment. He did not look a fellow who could be extravagantly gay, though there came back to his face in sleep, in contrast to the fast-maturing lines which Mr. Woodcock had remarked in Glen Ard, a certain abiding youthfulness which hardly leaves some faces. Still Archie Douglas looked sad, even stern, with the set muscles of the face relaxed and unformed into the pleasant look which they were wont to wear, for the benefit of his fellows, in his waking moments.

In his dress, and in his wearied air, he was infinitely more like the Joel Wray — the footsore tramp that had first presented himself to Pleasance — than the joyous, gorgeous young yeomanry officer just come from entertaining his prince. He had put on an old shooting-jacket to be "neighbor-like" with his gamekeepers, in whose company he had spent the night, when he had gone out to keep the peace, and speak a last protesting word to the inveterate delinquents against his own and his father's liberality. The night's adventure, foiled as it had been in so far as a close encounter with the poachers was concerned, had taken him through hedges and ditches, and along byways muddy

after recent rain, so that though he had changed his boots, his shabby, disordered dress was full of earth-stains. They went at once to Pleasance's heart, reminding her of the traces of a laboring man's toil, for which she had seemed to love Joel Wray more passionately, than for the grace of his address and the softness of his speech, or the cleverness of his resources, and the amount of his book-knowledge.

He slept soundly, and such sleep in its defencelessness and unconsciousness appeals strongly to the bystander, be he friend or foe. "Death's twin brother" sometimes simulates death wonderfully. Pleasance's heart began to flutter with indescribable awe, terror, and anguish, when the lively dark eyes continued closed and immovable. As it seemed to her, she could no longer distinguish the rising and falling breath on the lips, pale with recent fatigue, and grave with an absolute gravity, which had struck Pleasance with the first sensation of timidity that Archie Douglas had inspired in her. But she began to feel that she would not mind, though he should prove hard and unbending in his reception of her submission — as she never could have imagined him; nay, that she would welcome cold rebuke and harsh repulse with delirious gratitude, if he would but stir and give some sign of life.

Only a few weeks ago she had been in a degree prepared for seeing her old lover, her husband, dead or dying. Then she had set out for Shardleigh with small prospect before her eyes of a more merciful conclusion. Now when she had come on a different errand, with other thoughts in her heart, was she to find the threatened dread awfully fulfilled? Was she to be too late after all?

In her paroxysm of fear and despair, Pleasance did not call out, or touch him to put her ghastly doubt to the test; she did not summon help, or drop down senseless herself. She drew nearer and nearer to the recumbent figure, as if drawn by an irresistible fascination. She bent over it for a second, with a face as blanched and lips as breathless as its own.

From Fraser's Magazine.

OUR ARCTIC VOYAGE.

(AN UNSCIENTIFIC ACCOUNT.)

BY THE CHAPLAIN OF THE "DISCOVERY."

IN the spring of last year, a few weeks before the Arctic Expedition was to leave England, some old shipmates from the Naval College at Greenwich were dining with me, and told me that a question would be asked in the House that evening relative to the appointment of chaplains for the ships. My friend advised me to make application to the Admiralty to go in that capacity, if there appeared to be any chance of success; and I at once resolved to do so, for I had been rusting on half-pay for nearly a year and a half, and despaired of ever getting work again. On consulting the paper next day, I saw a report of a discussion in the House, from which it appeared that want of space was the only hindrance to the appointment of chaplains. So I at once wrote off to say that if they would only allow me to go I should be contented with a sea-chest and a hammock, as room was of so much importance. In a few days I was summoned to the Admiralty, where the first lord most kindly promised to nominate me to the "Discovery," provided I could satisfy the doctors. I accordingly went to Spring Gardens, and reminded the director-general that when invalided from the East, a few months before, he had jokingly told me that as I could not stand the tropics, the North Pole was evidently the place for me to visit next, and I begged him to allow me to act on his advice. I was pronounced to have just the constitution for the Arctic regions, and was dismissed with kind wishes and congratulations. At the Admiralty I was told that my appointment would be sent to me that evening, and that I should at once proceed to Portsmouth to join my ship. So the next morning saw me rapidly whirling past the sunny hills of Surrey on my way to the great naval port. Strolling from the station towards the dockyard, I saw alongside the jetty a little ship, with a band of green paint running round her hull, and the word "Discovery" inscribed in letters of gold on her stern. I stepped on board, but was at once ordered out of the ship by a young officer on deck, who doubtless took me for a British tourist. But I found the captain, and delivered to him my commission; and, kindly welcoming me, he introduced me to such of my future messmates as were present, and showed me the ship and my own cabin (for the hammock and sea-chest arrangement was unnecessary), introducing me to the foreman of the joiners, and giving him instructions to fit it up according to my directions. My new comrades advised me to get my outfit from Mr. Lack, of the Strand, as every one was employing him,

and I should see by his books what others had ordered.

So on my return to town to Mr. Lack's I repaired, and ordered an extensive stock of flannel, chamois-leather, and lambswool clothing, which served me well in the cold Arctic winter.

Preparations on board the ships, though energetically pushed on, were not completed till within a day or two of the expedition's departure. But for weeks before that time numbers of visitors daily presented themselves at the dockyard, anxious to see the ships. The good people crowded the two vessels in the dinner-hour and at other vacant times, regardless of paint, coal-dust, crushed hats, and other inevitable drawbacks, which they always submitted to with cheerfulness and even amusement. One day a special train ran from Victoria Station to Portsmouth for the convenience of London sightseers. The naval cadets from the "Britannia" training-ship were brought to Portsmouth to see the Arctic ships, and so were the boys from the Naval School at Greenwich. Among the visitors were the Prince of Wales and Duke of Edinburgh, who paid us a visit about a week before our departure, and brought us valuable presents of books. The ex-empress of the French also visited the ships, and her thoughtful kindness in supplying us with comfortable woollen head-dresses, or Welsh wigs, for the cold weather, was much appreciated. In fact, we received quite a number of presents — piano, billiard-table, books, Christmas gifts, eatables, and articles of clothing. Nothing could exceed the kindness shown us on all hands, by strangers and friends alike.

Dinners were given us by all sorts of societies, naval and military, scientific and civic, and many invitations we were compelled to decline, not having sufficient time at our disposal to enable us to accept them. Amongst others, one may mention a dinner given at the Admiralty by the first lord, at which were present, in addition to the officers of the expedition, several Arctic heroes, such as Admirals Back, McClintock, and Richards, and other distinguished persons. Also a splendid banquet given by the mayor of Portsmouth to the officers of the expedition ought not to be forgotten. A day or two after this the mayor gave a dinner in the same hall to the crews of the Arctic ships. After the dinner the men were joined at the tables by their wives, toasts were proposed and speeches made, and some of the men sang songs. All seemed thoroughly to enjoy themselves, and to appreciate the mayor's kindness and hospitality; and the entertainment was remembered and talked of long after, when living on pemmican in the frozen north.

But May 29, the day fixed for our departure, at length arrived, and all was ready for sea. It was a magnificent day, and the country looked lovely, causing a half-regret at having to leave it, perhaps for years.

Of course, as the queen's birthday, this is a general holiday at Portsmouth, and the dockyard was closed to every one, except those belonging to the Arctic ships and their friends. In the forenoon the lords of the Admiralty came down from town, and inspected the ships and their companies, examining everything and shaking hands with the officers on parting with kindly good wishes and hopes of a successful cruise. After this two photographs were taken on the upper deck — one of the officers, the other of the men. We then bid farewell to our friends, many of whom had formed a colony at Southsea for the last week or two. But some of them insisted on accompanying us to the dockyard, and once more going on board, so that we were pleasantly employed till the last. The indefatigable carpenter, who had superintended the fitting of our cabins, was still with us, not a little proud of the cheerful appearance that his paint and gilt work had given them, and ready as ever to drive in a nail or re-hang a picture. At the last a telegram arrived from the queen addressed to the commander of the expedition, wishing us success in the kindest terms.

Four in the afternoon was the hour fixed for our departure; and a few minutes before that time visitors had to leave the ships. Seamen embraced their wives and kissed their children; officers waved adieus to their friends; and, punctual to the appointed hour, we left the jetty, and began to pass through the harbor. This was a signal for cheers from the ships in the neighborhood. As we passed them, we were greeted with shouts from the huge Indian troop-ships. Further on we found the "Duke of Wellington" and "Victory" gay with bunting, their yards manned by seamen, who cheered in true naval style. Nor were the future sailors in the "St. Vincent" training-ship at all behind, but raised their voices as only boys can. Our men, their caps decorated with "royal oak," were in the shrouds, and replied to their comrades' greeting with hearty good-will. Now, approaching

Southsea beach, we see the old ramparts and the pier and common, thronged with people, the garrison drawn up amongst them looking like a scarlet thread on a black ground. The cheering was deafening, and was joined in by people on board the numerous boats and yachts with which the water was studded. The "Alert" led, followed by the "Discovery." At Spithead we were joined by the "Valorous," which was to accompany us to Disco with stores. As we approached Warren Lights, we sheeted home topsails to a breeze from the N.E., and lifted the screw. The yacht "Heather Bell," with the mayor of Portsmouth and many of his fellow-townsmen, was still with us; but after a time they left, and night began to close in as we dropped pleasantly down channel with a fair breeze.

Now that we are left alone, though hoarse from shouting, we surround the piano, and employ what remains of our voices in singing choruses and old sea-songs. At length we go to dinner, which is served today in our best style, in honor of the occasion, champagne sparkling on the board, and the table covered with roses and spring flowers.

Now that we are fairly off, let us take a view of our own ship — the "Discovery." The upper deck is literally crowded, for there is a deck cargo of coals, and ice-saws, gouges, chisels, planks, boats, and live stock are found everywhere. As she was built for a whaler, the arrangements below are quite different to those of an ordinary man-of-war. Beginning at the stern, one first finds the captain's cabin, with first lieutenant's adjacent. Then comes the engine-room. Passing this by a narrow wing passage, one arrives at the ward-room, a low chamber lighted from above. It measures about twenty two feet in length by eighteen in breadth, reaching from the mainmast for'ard. Great part of this apartment is occupied by the table, which takes up all the centre space. Beneath it is a great box, or jolly-boat, crammed with potted-meat tins, and causing considerable perplexity to those seated at the table as to the bestowal of their nether members. Woe to the luckless wight who thoughtlessly attempts to walk upright in the ward-room, for his head will assuredly make the acquaintance of a beam or stove-pipe, and be none the better for the encounter! Surrounding the ward-room are seven officers' cabins, each measuring but six feet in all three directions. Notwithstanding this small size, it is made to contain a chest of drawers, bed, wash-stand, table, chair, bookcase, bath, etc., etc., besides clothing sufficient for several years of the thickest and most cumbersome kind. Some of the junior officers' cabins, although two feet narrower, were found to afford sufficient accommodation.

Passing for'ards, we arrive on the lower deck, and the first thing we come to is the galley, where cooking goes on for all hands. Overhead a number of poles, spars, and other things are stowed, and even some cutlasses. The crew are divided into six messes, and on each side of the ship, suspended from above, are three mess-tables. These run athwart ship, and are flanked by lockers, covered with Brussels carpet, in which the men stow their clothes, and on which they sit at their mess-tables. These messes have a cheerful, homelike appearance, as the men have decorated them with pictures and photographs of friends. You will find the hands sitting here in their leisure hours, mending their clothes, or reading, playing games, or accompanying a nigger melody with the banjo in St.-James's-Hall style. The first mess we come to on the port side is occupied by the marines, who are the officers' servants. The seamen, and remainder of the ship's company, have the other five. Going on towards the bows, we reach the sail-room. Beneath the lower deck is the hold, where the ships' stores are placed, and in one part of which hammocks are stowed during the day.

Rising the morning after leaving Portsmouth, and going on deck, one found that we were dropping down channel with a fair wind, and at eight o'clock we passed the Start. Being Sunday, there was church service on the upper deck at ten o'clock. At noon we were off Plymouth, the breakwater being just visible in the distance. We then saw a small steamer coming out towards us, with the admiral's flag at the main. It was the "Princess Alice," bearing Sir Harry Keppel, port admiral of Plymouth, accompanied by a few friends. These visitors came on board each ship, staying an hour with us. Amongst them was a sailor of a former generation, a naval officer who had joined the service in 1804, and been on duty at Nelson's funeral. The enthusiastic nonagenarian declared that, had he been forty years younger, he would certainly have accompanied us if possible, and that his hearty sympathies went with us; on gaining his boat he waved his hat, and gave us three cheers. About seven in the

evening we were off the Lizard, and the "Valorous" left us for Queenstown. She was to fill up with coal there, and to take charge of the letters which she might find awaiting us. After that she would join us in Bantry Bay.

Next morning at seven o'clock we were between the Scilly Islands and the Seven Sisters. The day was bright and fine, the two ships keeping well together, and sailing seven knots an hour with a N.E. breeze. All hands were in capital spirits, and one constantly heard the sound of drum and fife on the lower deck, whilst the officers enlivened their leisure by playing the piano. Next morning Cape Clear was seen on the starboard bow; at noon the Mizen Head was in sight, and at three in the afternoon we anchored at Castle Town, Beer Haven, Bantry Bay. The country here is wild and mountainous; Hungry Hill, the highest point, having an altitude of more than two thousand feet. Of course we soon went ashore, and walked about the single street of the little town, chiefly of poor white houses, with a few small shops. Those of us who were acquainted with the west of Ireland were much struck by the beautiful deep blue eyes of the inhabitants, and also by the Irish language, which appears to be very generally spoken here. The stewards busied themselves in procuring milk and poultry, and different visitors came off to the ships. A solitary coast-guard officer is stationed here, who was pleased to meet with some comrades in this remote part of the world. The "Princess Alexandra," one of the Dublin Trinity House boats, was lying in Beer Haven, and her officers hospitably entertained some friends of theirs whom they found to be in our ship. In the evening some betook themselves to bathing, and a race was rowed between two boats, one from the "Alert," the other from the "Discovery," which terminated in the victory of the latter.

The next day about noon we steamed out by the western passage, having received some letters and telegrams at the last moment. About one o'clock we fell in with the "Valorous," bringing us more letters — the last we were to have. They also lent us a signal-boy, who was to return to them at Disco. The "Princess Alexandra," which had accompanied us out of the harbor, gave three parting cheers to each ship. We then shaped our course N.W. There was little wind, but an easterly swell, which caused the ship to roll considerably towards evening. About 5 P.M. we left some small rocky islands, belonging to County Cork, which was the last land we should see till we reached Greenland.

Now that we were fairly at sea, sou'-westers, sea-boots, and other articles of clothing began to be issued, and the men, with their usual love of new things, to appear in them, presenting a different appearance to ordinary man-of-war's-men. The weather was fair during the first week; but became bad on June 9, from which time we had it rough for nearly three weeks. This caused much delay, as the wind was almost always against us, though it occasionally shifted, and we sometimes went back one day over the course of the previous one. We parted company with the other ships, and did not see them again till we had crossed the Atlantic. We shipped many heavy seas, which often found their way to the ward-room or lower deck, causing much discomfort, but no one seemed to mind it. Sometimes we had to abandon the idea of a regular meal, and eat hashed meat out of soup-plates anywhere that we could place ourselves most steadily, some choosing to stand in their cabins, whilst others sat on the ward-room deck, leaning against the bulkhead. June 13 was the worst day that we had; we were in a cyclone, and the force of wind and wave was tremendous. A whale-boat which hung from the davits parted in two and had to be cut adrift, and two other boats were damaged, but afterwards repaired. We subsequently heard that in the matter of boats the "Alert" suffered as much as we did. Going on deck, I was astonished to see a white ball rolling along it pursued by a wave. This proved to be the officer of the watch, who had borrowed a mackintosh a foot too long for him, and whose dignity had been discomposed by a heavy sea breaking over the bulwarks and striking him full on the back. Hardly had I ceased laughing at the misfortune of my friend, when Nemesis overtook me in the form of a sea, drenching me to the skin, and compelling me to rush below and shift my clothes. But the real grievance is when a sea comes through the skylight and drenches you as you are peaceably sitting at table. One such time I well remember, when I had just been dealt a fine hand at whist, and was on the point of drawing the adversaries' trumps, when several buckets full of salt water suddenly fell into the middle of the table, spoiling my design, and, indeed, reducing the cards to a pulp. But as our cabins had no ports, we avoided the acme of misery, which, I take it, is a

shower-bath in bed. Oh, the horror of waking, with a yell, to find gallons of water streaming over you! I once experienced it three times in a fortnight. Several were more or less ill during the whole of our passage across the Atlantic, for there are some men who never can quite conquer the feeling of sea-sickness. Our unhappy signal-boy, being on his first voyage, was naturally very ill, but he struggled on bravely and stuck to his work, which is, after all, the only way to meet this evil. However, the rough weather was occasionally varied by a calm day, when we were able to steam and make some progress towards Cape Farewell, and on June 27 were seventy miles south of it. During our whole passage across the Atlantic we had only sighted one sail. This was a barque flying British colors, which passed us at some miles' distance on the 22nd. On June 28 we came upon the ground-ice for the first time. This ice comes down the east coast of Greenland and rounds Cape Farewell. It is different to the ice which comes south from Baffin's Bay, which passes more to the west side of Davis Strait. The next two days we were in the pack, and we felt the difference in more ways than one. The sea became quite calm, for the wind dropped. Sometimes we had sleet and drizzle; and in the middle watch the glass marked as low as 36°. This ice is a magnificent sight, and most striking when seen for the first time. Some pieces of it appear like monstrous toadstools, being eaten away from beneath by the water. The delicate blue tints on the lower part of these are most beautiful, resembling those seen on the Rhône or Grindelwald glaciers. Some bergs were imposing from their size, for we already began to observe them as high as our main truck. Yet for every foot out of water there are, I believe, seven beneath the surface, and as they are often very long, their dimensions are huge. We also saw a number of bottle-nose whales, spouting large jets of water into the air. The crow's nest was now hoisted to the top of the main-top-gallant mast, for the use of the look-out. This is indispensable in passing through ice, for one can only see a short way ahead from the deck, and without a look-out aloft it would be impossible to select the right channels or lanes of water, by which ships pass through the floes.

We sighted the coast of Greenland for the first time on July 1, and steamed northwards, having the land at about fourteen miles' distance on the starboard side. These hills, the "icy mountains" of Heber, are very bleak and bare, and were powdered with snow when we saw them. Occasionally a glacier is seen in a fiord, running down to the sea, and it is these glaciers which shed the large bergs. The land here exceeds twelve hundred feet in height. Later in the day we sighted the "Alert" about eight miles distant. We had not seen her since we parted in the cyclone on June 13. The next day we came up with her, and it appeared that her course had been much the same as ours. Both ships lay to for some hours in the afternoon, and some of our officers and men fished for hallibut, of which we caught seven very fine ones. They are caught by letting down a baited hook to the bottom, and when a bite is felt, the fish is drawn up to the surface, and then harpooned. Four days after this we arrived at Godhavn (Port Lievely), Disco Island, on July 6, at 1 P.M., the "Alert" having preceded us by about two hours. We found the "Valorous" in the harbor, she having arrived on the previous day. This ship was only to accompany us as far as Disco, there to fill us up with coal, and then to return to England. We found the "Alert" alongside the "Valorous," taking in coal. Some scientific gentlemen, who had come in the "Valorous," were in a boat dredging for marine animals.

The island of Disco is about sixty miles long, and of the same breadth. It is separated from the Greenland coast by the Waigattet, a strait of some twelve or fifteen miles broad. Godhavn is situated in the southern extremity of the island, between the 69th and the 70th parallels of latitude. It is a Danish trading settlement, placed in a commodious harbor. To the left, as one enters it, are rocky mountains, covered with snow at the top. When we arrived, quantities of snow still remained in the ravines, through which torrents, formed by the melting of the snows, rushed down to the more level, grassy land between the mountains and the sea. These mountains, which are about two thousand or three thousand feet high, may easily be ascended by the ravines. On the right hand, or opposite side of the harbor, is the settlement. It is built on hilly, rocky ground. It has nearly a hundred inhabitants, and is therefore a place of some importance — in fact the governor of north Greenland has his residence here. His house is a good type of the better class of dwellings in the settlements which we visited. Both walls and roof are of wood, and, for the most part, painted black.

The house is low, consisting only of ground-floor and attics in the roof, which is very high, like those in old German towns. In front of the residence is a flagstaff with the Danish flag; also a battery of three small guns, which are used for firing salutes — we were greeted with nine on our arrival. Within one finds the arrangements of a European house — varnished floors, white porcelain stoves, tables, pictures, and bookshelves. There is a similar house at which two Danish merchants reside, one of whom is governor of Godhavn. The other inhabitants live in smaller black wooden houses, with a room below for the family, and a loft above, reached by a ladder from without, for stores. Entering a cottage, you find yourself in a comfortable apartment, lighted by glass windows, and decorated with pictures of Copenhagen or scenes from the war of '64. Along the whole of one side runs a raised platform, on which the family sleep at night and sit in the daytime. There are also other seats and benches. In the centre of the room stands a stove, making the place unpleasantly warm; added to which discomfort, there is a disagreeable odor of the sealskin clothes, so that one makes only a short visit of it. The people always seem pleased to receive strangers, display their different treasures, and offer for sale model kyaks, slippers, and tobacco-pouches of home manufacture: all made of sealskin. You may even be entertained by a tune played on a concertina, and you often find a clock and several books. The people are of a mixed race, in some the Danish and in others the Esquimaux characteristics preponderating. Thus some of them have blue eyes and fair hair, and others stunted forms not much above five feet high, huge flat brown faces and coarse black hair. Some of those who look least European live in rude, low huts, built of stones and turf. These are entered on hands and knees by a long, low passage, or rather tunnel. Yet even these huts are well lighted by large glass windows; walls, roof, and floor, on the inside, being lined with wood, and the internal arrangements the same as in the other houses. The dress of the people is mostly Esquimaux, but the Danes partially retain the European costume. The habit of both sexes is very similar, but one soon learns to distinguish between them. Both men and women wear sealskin jacket and trousers, the jacket having a hood to be drawn over the head. The women wear high sealskin boots, made of dressed leather, dyed yellow white, or pink, and above them, round the knees, is often worn a small piece of white linen about five inches broad. The women wear cotton jackets over their sealskin ones — blue, green, or pink in color — and so do the men sometimes. Unlike the men, the women have the hair gathered up in a knot at the back of the head, bound round with a piece of ribbon, and they wear a colored handkerchief round the head. About the houses, or near the beach, one sees the dogs, basking in the sun. Sometimes there is a tremendous noise, when they fight, or all set on one unfortunate animal, and worry him without mercy. They are fine animals, with shaggy thick coats, rather wolfish though in their appearance. They are possessed of great strength, and are most useful in dragging sledges over the snow and ice. One also sees kyaks placed on a rock or on the roof of a shed. These are long, narrow canoes, made of sealskin stretched over slight frames, and very light. They are dyed black when new, but lose this in time and become white. The legs must be introduced through a small hole in the centre, which is so narrow that few people unaccustomed to a kyak can get into one. The Esquimaux manage them with great adroitness; they can turn a somersault in one, their bodies passing beneath the canoe, immersed in the water, and the canoe making a complete revolution on its shorter axis. But if an inexperienced person capsized in one he would, in default of help, be drowned, as he could neither extricate himself from the kyak nor right her again. Two only of our party were able to manage these canoes. One officer attempting it was half drowned by the canoe capsizing.

There is always a store at a settlement to supply the wants of the inhabitants. They buy cotton and linen for clothes, rice and flour for food, and tobacco. Powder and shot are sold to them for hunting at a very cheap rate, and with a small rifle, which they obtain for 30*s.* from the governor, they make certain of a seal at a short range. This animal is the main support of these people. It provides good wholesome food for themselves and their dogs; the skin being made into clothing, and the oil from blubbers supplying light and warmth. But they shoot many more than would suffice for their own wants, and the surplus skins and oil are exchanged for articles of European manufacture, and form the principal exports of Greenland.

The weather was splendid during our week at Godhavn, and those who were free to do so availed themselves of the opportunity of rambling about the mountains and valleys, and shooting the eider-ducks on the sea. One was well repaid for a hard climb by a splendid view from the snow-covered plateaux at the top of the mountains. On the day after our arrival I set out with three companions to ascend the neighboring heights. I chose one of the ravines, which I found pretty severe climbing, it being filled with snow. A little more than an hour sufficed to reach the summit, where I was knee deep in snow. My friends had hoped to find an easier ascent round a shoulder of the mountain, but they had very hard work, and were compelled to take twice as long. We saw no signs of life up there, except a solitary ptarmigan, still wearing its white winter plumage. Our descent by glissade over the snow in a ravine was most rapid, and at the base of the mountains we found more vegetation than we saw anywhere else in the Arctic regions. By the sides of the rapid streams was an abundance of velvety moss, of the most beautiful green that can be imagined. A number of dwarf willows several inches high were also seen, and a quantity of small, though lovely Arctic flowers, of which the red saxifrage makes the most show. A number of stacks of peat were standing here; the people using it for fuel and for building-purposes. On reaching the sea one of my comrades was venturesome enough to bathe, but he did not remain long in the icy water. This excursion was our first experience of Arctic mountaineering

Duck-shooting is very good fun. The best way to get at the water-fowl is to take a small boat at night and paddle up to them as they are feeding on the water. It hardly does to shoot them on shore, for though one may get a shot as they fly past, the birds mostly fall into the water.

Outside the harbor a number of icebergs floated about, which looked very beautiful, especially when the sun was at its lowest at night; for of course it never set now: we had been enjoying perpetual daylight for some time. Frequently there was a beautiful mirage, doubling the size of the bergs on the horizon, and showing the mainland very plainly; about midnight, tinged by the glorious orange and crimson hues in the sky, this appearance was magnificent. We were somewhat troubled by gnats, or mosquitos, as they are sometimes called, though they are much smaller and less formidable than the pests of tropical marshes which go by that name. Still they were able to attack one or two to such purpose that they were unfitted for work, and had to be put on the doctor's list.

There are two graveyards at Godhavn, and the graves are marked by wooden crosses, painted black and white, with names and ages of the deceased. The names appear to be all Danish, with the exception of a few Scotch ones — marking the resting-places of men who have belonged to whalers. But these cemeteries are neither of them situated near the church — a plain, black, wooden structure, with low sash windows and high-pitched roof. Within one finds the arrangements customary in a Lutheran place of worship. Opposite the entrance is a small altar with candlesticks, pewter paten and chalice, and plaster-of-Paris image of Christ after the celebrated statue of Thorwaldsen. Behind this hangs an engraving of the Ascension. There are plain deal benches for the accommodation of more than fifty people. The services are performed by the schoolmaster, a worthy man of mixed race; and such ceremonies as marriages and baptisms are deferred for an occasional visit from the pastor of Upernavik. The use of this humble fane was borrowed by us on the Sunday that we spent at Godhavn, and holy communion was celebrated there by the chaplains of the three ships, the service being attended by a large portion of the officers and men.

The inhabitants of Disco resemble the German peasants in their love of waltzing. There is a shed adjoining the store, which is sometimes used as a ball-room in the evening, and on different nights during our stay officers and men from the Arctic ships led out the fair Esquimaux. We finally adjourned to the green sward outside, as the atmosphere in a small room full of sealskins proved very oppressive.

After a stay of nine days we quitted Godhavn on the evening of July 15. The "Alert" took the governor of north Greenland to Ritenbank, our destination. Before leaving, salutes were fired on shore, and replied to by the "Valorous." There being no wind, the "Alert" steamed and towed the "Discovery," the "Valorous" following. The sea was as smooth as glass, but the weather cold and foggy, so that it was necessary to keep sounding the fog-horn from time to time. On starting we steered to the north-east, and reached Ritenbank at eleven o'clock next morning.

This settlement consists of a few turf hovels, and one or two wooden houses. It is situated on an island between Disco Island and the mainland. Here we took in twenty-five dogs. The "Alert" had obtained the same number at Godhavn. The day being beautifully fine and bright, each ship sent a boat party to a "loomery" in the neighborhood. We sailed and rowed in our boats for several hours before reaching it. There we found numbers of looms and gulls flying over our heads, and thousands of them perched in long rows on the ledges of the fine lofty cliffs. It was a most remarkable sight, and we expected at first to fill our boat with birds. But most of them were out of range, and of those that we did shoot many remained on the ledges of the rocks where they were perched. However, we bagged a fair number; but, hoping to obtain more, landed, and tried to reach them. I left my boots behind, thinking that bare feet would hold the rock better than hobnailed boots, but had them larcerated for my pains by the sharp stones. Attempting to approach the looms by a narrow ledge on the face of the cliff I lost my balance, and picked myself up, cut and bruised, among the rocks below. We then proceeded to the head of the bay, where we found another loomery, and got more birds, also some eggs. At the extreme end of this bay a mountain stream runs down to the sea through beautiful mossy banks. Here we landed, and climbing the hills for some distance, arrived at a position from which we obtained a glorious view. At a great depth immediately beneath us was an extensive sea of ice, hardly distinguishable from water, so smooth was its surface. Large bergs appeared at intervals on this icy lake, and in the centre stood a rocky island. On the farther side of the lake a glacier flowed into it, from which the bergs are shed. This was one of the most striking sights that we saw in the Arctic regions. On our way back we made another halt at the great loomery, and got a few more birds. A great many cartridges were fired with little effect. I had purchased an old-fashioned fowling-piece from the governor at Godhavn, such as is used by the Esquimaux, paying for it the enormous sum of 1*l.*, and had now an opportunity of testing its powers. But it was all to no purpose that I perseveringly loaded the piece time after time, laboriously pouring powder and shot from rude horns, after the manner of our grandfathers, and ramming down newspapers as a wad. The only result of firing was a great noise, which, however, did not at all discompose the dignified gravity of the looms, who continued perched on the ledges of the cliff, solemnly surveying the whole affair. Growing discouraged, I at length handed the gun over to one of the men, but after four repeated essays to knock over a bird, he gave it up as useless. A wag remarked that the looms evidently thought that we had come to bring them the latest news from the outer world, and that he could see them curiously peering down the gun-barrel with one eye, to read the newspaper. We afterwards found that this gun scattered the shot so much as to be of very little use, and it was consequently called the "distributor." I had also bought a small rifle at Godhavn for 30*s.*, of the sort which the Esquimaux use for seal-shooting. Its fire is most accurate at a short range, as I have often proved; but as the only bullet-mould I could obtain made a bullet far too large, this weapon was of little service. It was derisively named the "tickler," and Disco smooth-bore and rifle were both put on the shelf, with sincere pity for the unhappy natives who are compelled to use these primitive weapons.

But to return to the boat excursion. Having collected the looms, and stowed them at the bottom of the boat, we rowed for the ship, and tried to enliven the time with songs, every one taking his turn, and "Three Jolly Post-Boys," "When we were boys together," "Ten thousand miles away," and sea-songs too numerous to mention, were shouted out with great enthusiasm. As I was toiling at a cutter's oar in the bows, a halt was called to drink the last of the grog, and a little was passed to me in the cup of a flask by my messmates in the stern. Being rather fatigued with rowing, and not wishing to keep them waiting, I finished it at a draught, and returned the empty cup. I heard nothing of it at the time; but it afterwards transpired that I had unconsciously swallowed all the remaining liquor, on which my friends had been reckoning for some time, and though I vainly pleaded ignorance, it was many a long day before I heard the last of the Ritenbank grog. But as everything has an end, we at last reached the ship at three o'clock in the morning, and foraging parties immediately commenced to explore the recesses of the steward's office and the meat-safe. Thence we at length procured meat-pies, poultry, mutton, and *pâté de foie gras*, which, together with our allowance of beer and sherry, formed a sumptuous repast, which we im-

mediately attacked in a ravenous manner; for, with the exception of a few sardines and such like trifles, we had taken nothing since the previous morning.

Thus ended a delightful little excursion, in which we were well repaid for our labors by a small addition to our stock of fresh provisions and by most magnificent scenery. About an hour after our return to the ship, the "Valorous" left us and proceeded up the Waigat to coal at a mine there. Two hours after we weighed anchor and followed her, signalling farewell as we passed her in the evening. There is fine scenery in the Waigattet, the mountains being bold and lofty; also many fine bergs were on the sea when we passed through it. Proceeding northwards, we arrived at Proven on the evening of the 19th. This is a settlement of much the same size as Godhavn. It is on a small island a little north of the 72nd parallel. We only stopped here for two days, taking a number of soundings and making a rough survey of the harbor. Before leaving, we took on board Hans Christian, our Esquimaux hunter and dog-driver, a most useful man, who had accompanied Kane, Hayes, and Hall in their expeditions. He brought his kyak and rifle with him, for, like David, he preferred the rude weapon which he had proved to the more finished arms of strangers. And right well did he use his muzzle-loader, and many times we had to thank him for a meal of seal-meat, when otherwise we should have been compelled to content ourselves with navy salt beef. He wore a rather rueful countenance on leaving home for his fourth expedition, introducing himself to us by saying, "My wife she plenty cry all night; she lovvey me too motch." The "Alert" had shipped an Esquimaux at Disco, named Frederik. At Proven we found the governor's wife rather in distress about her baby. The annual brig from Copenhagen had not yet arrived, and there was consequently a dearth of suitable food. We were happy to be able to supply a few tins of Swiss milk for the baby's use, for which the mother was exceedingly grateful. One would think that life in these little isolated places must be misery to a lady accustomed to the amenities of European civilization. The governor received us with hospitality, and gave us some beer of native manufacture — not quite equal to Bass, but still a very tolerable beverage. In a shed I saw a large iron tank filled with seal-oil for exportation; it appeared to be particularly clear and good. A few hours after leaving Proven, we stopped at a loomery for an hour or two, and managed to bag a couple of hundred birds. Shortly after we anchored at Upernivik, where we left our letters, to be forwarded to Europe by the Danish vessels which annually visit the Greenland coast. This was our last opportunity of communicating with home. Going on shore, we were hospitably received by the governor and pastor. We only stayed here for the day, leaving in the evening, and passing through a quantity of ice amidst rocky islands.

At night we saw the Upernivik glacier, stretching away on the eastern horizon mile after mile. We could hardly believe it to be a glacier at first, so immense did it appear. Yet I suppose it is as nothing compared with the great tracts of ice in the interior of the continent. As seen in the far distance it has the appearance of an undulating extent of arable land. In the morning we stopped for a few hours near the Esquimaux village of Kangitok, where our Hans had once acted for a short time as schoolmaster. Some of the natives came off to the ships in their kyaks, hoping to barter fish or sealskin boots.

The next day we saw a bear on an extensive floe near which we stopped, and several officers went in pursuit. But being alarmed at so many assailants, the bear went off at a quick, shuffling trot, and was soon out of range. This was most unfortunate, as we never saw another. So the bear which had been selected as a crest for our crockery proved to be rather inapposite. Yet traces of these animals were once or twice seen near our winter quarters; but it must be rarely that one ventures so far north, as they would find hardly any seals. We not only lost the bear, but also one of the dogs, which ran away over the floe, and refused to return or to allow himself to be caught.

On the evening of the next day, July 25, we reached Cape York. This is the northwestern point of Melville Bay. Here are high bold cliffs, having a little moss on the slopes. A number of huge bergs were seen, they having been shed from a neighboring glacier. One part of the sea was covered with ice, and over this we soon saw several Esquimaux approaching. They picketed their dogs, driving their spears into the ice, and walked to the ships, which were anchored to the floe. They were much finer men than their cousins of the Danish settlements, but are quite uncivilized, for they do not communicate with the settlements, and only have a chance visit from the whalers. We gave them some matches and a few other

trifles, and a little sugar gave them great delight. In the course of the night they returned with a few others to the ships, which had moved some miles. They had four sledges drawn by twenty-four dogs. Their weapon is a spear six feet long tipped with narwhal ivory. Their dress is similar to the Esquimaux that we had already seen, except that the trousers are of bearskin. We gave them some of the skin and blubber of a narwhal, and they ate it most voraciously, cramming as large a portion as possible into their mouths, and cutting it off, close to their noses, with their knives. In fact they are as thorough savages as one could find anywhere. These people were very friendly with Dr. Kane, and Hans at that time chose one of them for his wife. We wished to take a brother of hers with us, but that was impossible, as he was absent on a hunting excursion. The narwhal of which I spoke was a female of about twelve feet in length, with a beautiful straight horn four feet long. It was speared by a harpoon gun from one of the boats. A number of seals were seen, and a great many little awks were shot. However, we did not stay many hours at Cape York, but continued our voyage northwards, with fine, lofty cliffs on the starboard side. In the fiords, descending to the sea, are glaciers, from which huge masses of ice became detached. We now saw bergs much larger than those which we had previously met with, some being about three hundred feet high. On July 26 we passed by the Crimson Cliffs, and Cape Dudley Digges of Baffin, and arrived next morning at the Carey Islands. Here we stopped for a couple of hours, whilst the "Alert" landed a dépôt of provisions, in case of need on our return to the south. Dépôts were to be established at different places on our way. A little after leaving the Carey Islands, we passed between Hakluyt and Northumberland Islands. The day was fine and bright, and the effect of the high cliffs was magnificent. Huge bergs floated on the sea, on which numbers of little awks were seen. Thousands of them also perched on the cliffs at one part of Hakluyt Island.

The next morning we anchored in a bay a little to the north of Port Foulke, the winter quarters of Dr. Hayes' expedition in 1860–61. Several excursions were made, and a few hares were obtained. Little awks were shot on the sea. One party had a very long, but most interesting day, crossing the magnificent Brother John glacier, which flows to the sea from an enormous Mer de Glace. One of them had the luck to shoot a reindeer, the only one we ever obtained. It was cut up, and the haunches, and most of the meat, carried back to the ship. Deer are said to be most abundant here in the winter, and we saw a number of horns, but only four of the animals themselves. The skull of a musk-ox we also found. We only stayed at Port Foulke one day, continuing our voyage next morning. We were now in the narrowest part of Smith's Sound; there is less than thirty miles between the east and the west land, a little to north of Port Foulke. We crossed over to the west land, somewhat encumbered by large masses of floe, which were drifting about in mid-channel. The next day, July 30, we reached Cape Sabine, the southern point of Hayes' Sound. Here we stayed for some hours to raise a cairn, and place a dépôt. Hayes' Sound is a wide channel leading from Smith's Sound westward. We tried to leave this place, but were soon compelled by the state of the ice to put back again, and remain for four or five days in a small harbor near Cape Sabine, thence named Wait-a-bit Harbor. After this, we cruised about in the south part of Hayes' Sound for about five days more, being still prevented by the ice from going north. The weather was now becoming bleak, snow falling at times. Excursions on shore were made, but only a few hares were obtained. Some ruined Esquimaux huts were discovered, surrounded by musk-ox and reindeer bones; a fox-trap and knife-handle were also found near them. However, we at last found a lead across the sound, and anchored to the floe in Franklin Pierce Bay on August 9. This is near Cape Prescott, the north-east point of Hayes' Sound. We were detained here for another three days. Several walruses were seen, lying in groups on the floe. Two of them were shot by harpoon guns from the boats' bows. Their flesh was very useful as food for the dogs — a year later we would gladly have eaten it ourselves. On our voyage, whether from want of exercise, or from some other cause, a number of the dogs went mad, and a great many died. This was a most unfortunate thing, as they are invaluable for sledging. During these tedious delays we whiled away the time by sledging over the floe, learning to manage the dogs. In the evenings we got up football matches between the two ships' companies, and a game of rounders was sometimes attempted. We then crept a few miles further along the

coast to Dobbin Bay where we had to remain some days. A few ptarmigan and hares were shot here, and a sledge party went one day to Cape Louis Napoleon, some of the men getting thoroughly wet from falling into the sea through cracks in the ice. At Dobbin Bay docks had to be cut in the floe, in which to place the ships. This was to prevent them being nipt between the floe and moving masses of ice. A dock is made by cutting the floe with ice-saws, suspended from wooden tripods which were erected on the ice. The masses of ice thus detached from the floe are then pushed out with long poles, or ice-points as they are called. A sheltered place is thus formed, in which the ship may lie secure.

For some time we continued to move slowly to the north along the west coast of Kennedy Channel, travelling a few miles when the ice opened out from the shore and left a passage, and then anchoring to the floe again. Sometimes a hare would be shot on shore. We were now able to skate in the evenings, on the pools of frozen fresh water which are found on the floe. These pools are formed by the melting of the snow on the surface of the ice in warm weather. From time to time dépôts of provisions were landed.

At last we got into open water, and arrived at Bessel Bay, on the east side of the channel, on August 23. But we only remained one day there, and then crossed over again to the west land, anchoring in a convenient bay somewhat farther to the northward. We reached this early in the morning of August 25, and it was fixed upon as a good place for us to winter in. So in that harbor we remained for nearly a year, and it was thence named "Discovery Bay." It is a large, well-sheltered harbor, separated by a large island, called Expedition Island, from Lady Franklin's Channel, or Bay, as it was afterwards shown to be. The harbor can be entered on either side of the island; we came in by the eastern entrance, where a long breakwater, running from the island, narrows the mouth of the harbor. Mountains of two thousand feet high surround the harbor, but close to the ship's anchorage a gently sloping valley gave access to the land. This place is situated in lat. 81° 44m. N., long. 65° 3m. W., so that the winter quarters of the American ship "Polaris" were nearly opposite on the east side of Hall's Basin. The "Alert" accompanied us in, but left next day, her object being to proceed as far north as possible before winter set in. She took with her an officer and seven men from our ship, with a sledge and its equipments. They were to return to us as soon as possible, bringing us news of the "Alert's" position, but were unable to reach us before the spring. Cheers were given by the crew of each ship as the "Alert" left us. She was prevented by the ice from going more than a couple of miles for some days, but on the 28th she found a lane of water leading north, and we finally lost sight of her.

As soon as we had settled down in our winter quarters, the captain ordered the crew to fall in on deck, and told them that we had reached our final destination. On this they gave three cheers for winter quarters, and three more for the captain, and were thankful that such a good place had been selected, as it was, without exception, the best harbor that we had met with for hundreds of miles. The winter was fast approaching, snow already lying several inches thick on the land. Without loss of time all hands commenced carrying boats and spare spars on shore. Also timber, sledges, and everything that could be got rid of. A large tent was made of yards and sails, in which part of the provisions, ammunition, and other stores were placed. This work occupied several days.

In the mean time such of the officers as were free to do so were exploring the neighboring country, making long excursions over the mountains, and through the valleys, and often returning with fine hares hanging from their belts. Our Esquimaux hunter was now in his proper element, and of course did better than any one else. He procured a few seals which were given to the dogs. But the game of most importance was the musk-ox. We managed to shoot thirty or forty of these animals during the first fortnight, but after this saw no more of them till the next spring. A herd of oxen was close to the shore as we entered the harbor, and some of the "Alert's" officers landed and shot nine — in fact, nearly all that were there. Very few were ever permitted to escape. If the bull, who is the leader of the herd, be shot, the others seem to be uncertain what to do. They may then be approached and slaughtered at pleasure. When attacked, they defend themselves by keeping close to each other, with their tails together, and heads outwards, which they toss defiantly. But there is little sport in musk-ox hunting — it is mere butchery, and as such we regarded it, for the fresh meat was of course invaluable for winter use. The frozen carcases, hung in the shrouds,

would keep fresh for an indefinite period, and were well out of reach of the dogs. The "Alert," being further north than we, hardly got any musk-oxen, for they probably travel south before winter sets in. They are not unlike Kylo cattle in appearance, being small, sturdy animals, with enormous heads, and massive horns. Their hair, which is black, slightly tinged with a reddish brown, is very long, and in the winter, beneath this, is a quantity of thick wool. The oxen are very active, ascending the steep rocky hills as easily as goats. The flesh is occasionally nearly as good as English beef, but it often has an unpleasant musky smell and flavor, at times so strong that some people are unable to eat it. We could not account for this muskiness, neither age, sex, nor time of year, appearing to regulate it. In the same herd some of the animals would have perfectly sweet meat, whilst others would be atrociously musky. But if the cooking be thorough, this evil is much modified. We were obliged to make several sledge journeys, with strong parties of men, to bring home the game from places where they had been shot, sometimes miles distant from the ship. When skinned and cleaned, and the head taken off, the carcase would often weigh nearly three hundred pounds. This preparing the slaughtered beasts for carrying off was most repulsive work, to say nothing of the cold. There can be few things more unpleasant than standing for hours in several inches of snow, with a biting cold wind blowing, skinning a frozen carcase, redolent of musk. This task completed, we would stand round the small stove, and eat hot steaks which the cook had been frying for us. Then nothing would remain to be done but to load the sledges, and proceed homewards. We had several such laborious, but most satisfactory days, and only wished that we had occasion for yet more of them. But the winter was rapidly approaching; and the musk-oxen were leaving us. Once some which had been skinned, and left on the hillside where they had been shot, were found by the party going to fetch them to be so strongly frozen to the rocks that six or eight men hardly sufficed to tear them off by means of a rope — in fact, part of a rock came off adhering to the ribs of one of the carcases. Most of the sheep had been killed on the voyage, but the few which remained on reaching winter quarters were landed, whereupon a great uproar was heard, the dogs having attacked them. Some of them being nearly worried to death, had to be killed out of hand, and were hung up in the rigging with the frozen hares and musk-oxen.

The winter began in earnest soon after our arrival, as 20° was about the average temperature at the commencement of September, and something below zero at the close of the month. Consequently the sea began to freeze rapidly, and the ice would bear by the 10th of September. In the course of the winter it became three feet thick. We tried skating on the newly-formed ice, but found it hard work for the shins, very different to skating on fresh-water ice. After a week or two we made a rink, which we kept in order and used during the whole winter. We formed it by making a hole in the ice, drawing water out in buckets, and pouring it over a large circular path, which we had previously marked out. This path was about eight feet broad, and some hundreds of feet long. The water poured on to the floe formed very good ice. After a gale of wind or snow-fall we had to brush the snow off the rink, and this snow at last formed a regular wall round it. The country now became completely covered with snow; but we had no heavy snow-storms, and it never was thicker than a few inches, except in hollows and drifts. "Toboggoning" now became a favorite amusement. Sitting or lying on a small sledge, one descends the hillsides at a tremendous pace, amidst a cloud of snow, and, on reaching the bottom, the beard and eyebrows are found to be caked with it.

A little preliminary sledging was done in the autumn, in the early part of October, but the important work was reserved for the spring. The survey of the harbor was, however, made on our arrival in winter quarters, flags being taken in boats, and erected at conspicuous points, as marks. As soon as the ice would bear, the surveying officers set out in a dog-sledge, putting up more marks, and taking measurements and angles. One party tried a journey over the hills with a light cart instead of a sledge, but this proved quite impracticable, the wheels sticking in the snow, and the party soon had to return. The cart proved more useful in the summer, when the hills were bare of snow. We now built several houses on the floe, near to the ship. They were made of blocks of ice, cut from bergs which were frozen into the floe. The blocks were properly squared, and the walls formed of them by cementing them together with a sort of mortar made of snow and water mixed.

The roof of the building could be made of sails and spars. The largest of these buildings had a chimney, and was employed as a smithy. It had a beautiful appearance in the winter, when illuminated by the fire from within. A smaller house was the magnetic observatory, and a small roofless building contained the large telescope. Some wooden observatories, brought from England for the purpose, had been already erected on shore, and, as the weather became colder, were banked up with snow for warmth.

At the end of October the ship's sides were also banked up, and the upper deck covered with eight or ten inches of snow. The effect of this snow covering was at once apparent, the temperature inside the ship being considerably raised. Some time previously an awning had been spread over the upper deck and curtains hung from the awning to form sides, so that the upper deck was formed into a large tent. This gave secure protection from wind. Outside the ship staircases were made of large slabs of ice by which to walk out on to the floe.

On October 16 we lost the sun for one hundred and forty-two days, though we had daylight for some time after. The tints in the sky and on the snow-clad hills about this time were most lovely — orange, crimson, and purple. But one cannot say that we were ever without signs of the existence of the sun. Even on the shortest day a very faint glimmer could be seen towards the south at noon. We always had some light from the stars, and for ten days in each month we had the moon. The white snow of course forms an excellent reflector, and economizes the light wonderfully. We were too far north to witness a good aurora borealis, though there was sometimes a faint white appearance in the sky, rapidly changing in form and position. A periselene was occasionally seen, also a parhelion, on the sun's return.

After the ship was housed in for the winter, the daily divisions, or inspection, was held outside on the ice. Muster and prayers in the open air with the glass as low as —50° would be decidedly unpleasant were not the ceremony made very brief.

A space was measured on the floe for exercise; at first, by a flag half a mile off, but afterwards a triangular path of a mile in length was marked out, having the ship at one of the angles. From this road the snow was cleared by means of pickaxes and shovels. The path had occasionally to be recleared, especially after a gale; and the snow thus shovelled off was useful, as it formed a wall round the walk, which could otherwise not have been seen. Every one used this path daily in the winter, more from duty than pleasure, for walking continually over the same track in cold and darkness proved cheerless work. The men used to cut fresh-water ice from pieces of berg, and bring it to the ship on sledges, to be melted for use.

A man looks a singular object when dressed in Arctic winter costume. Out of doors the outer garments mostly consisted of sealskin articles, supplied by Jeff of Regent Street. Heavy duffel boots were universally worn, and the feet never got cold in them. The duffel reached to the knee, where it was tied to the leg to support it, and beneath the foot was a cork sole, more than an inch in thickness. And great need there was for the warmest clothing, for the cold was very searching at times. Yet we had sudden and great changes of temperature. There was little wind, but when it did come it was mostly from the south, and brought warm weather. Thus on December 4, the temperature was raised to 27° by a wind, whereas the average was perhaps —40°. As an instance of a very sudden change on February 4 the glass stood at —46° at midnight, and in 9 hours' time it was at —1°: a difference of 45° in a morning, the difference in fact between a cold winter and a hot summer day in England. The cold became decidedly disagreeable when below —40°. March 4 was the coldest day we had, the glass marking —70°·5 at night. This was too much even for the dogs, who live comfortably in the open air almost all the winter. One poor creature was frozen to the floe by his tail, and another had his tongue frozen to the inside of a meat-tin, from which he had been eating. The unhappy brutes showed that the cold ice pained their feet, by continually raising them, like a cat on hot bricks. So they were taken on board, and thawed for a day or two till the worst was over. "Thawed" is the right expression, for their long hair got frozen into icy lumps, which rattled against each other as they moved about, like lustres on a chandelier. But though our Esquimaux built some ice-kennels the dogs were never seen to use them. Hans himself seemed to have no regard for the cold. I saw him working outside the ship on the coldest day, with his hands uncovered, and on expressing my surprise, he only replied, "You Englishman feel plenty cold, me Esquimaux man no feel cold."

Another instance of the hardiness of an Esquimaux constitution. One very cold night in January this worthy was nowhere to be seen, and parties were sent out to find traces of him. After a long search in the dark, his footsteps were made out in the snow, and several men set off to find him. After several hours' heavy walking through deep snow in duffel boots, they found the truant comfortably asleep, burrowed into a snowdrift on the side of a hill. When aroused, he declared that he was "plenty warm." What put this freak into his head we could never discover, but at our next entertainment one of our seamen gave us a song which he had composed, narrating the incident in a comic style.

The frost has one recommendation, viz., that it preserves meat. Musk-oxen when required for use had only to be taken down from the rigging and chopped up like wood. A barrel of pork would have the staves of the cask torn from the meat, and the solid mass, looking like a great lump of ice, would then be sawn up. One does not feel the cold for the first minute or so, but after the body is deprived of its warmth, the change from 60° down below, to —40° in the open air, is very apparent. One can *see* the body, and the clothes too, losing their heat, thick vapor rising from both, on going in the cold air. But we never wished for a warm spell, for we then had a thaw in our cabins. The ice forms over the iron bolt-heads, and on the walls and part of the ceiling nearest to the outer air. Sometimes one's drawers would be glued in, the water having run down at the back on occasion of a thaw and afterwards frozen. There was a constant drip on the lower deck, which was very disagreeable for the men, making bedclothes and everything else wet, and causing colds. Sometimes one could hardly get to sleep at nights on account of water dripping into one's face from the ceiling.

But though cold weather was best for the inside of the ship, it was so keen in the air that the slightest breath of wind, which could not ordinarily be perceived, was distinctly felt. One has then to be on the look-out for frost-bites. These attack some people much more than others; but if one is properly clothed, and keeps moving, none but the exposed part, that is a portion of the face, will suffer. The nose or cheeks are the parts usually affected. The blood leaves the place, and a yellowish white patch is formed like tallow in appearance. The circulation is easily restored, if taken in time, by placing the hand on the part affected; this is much better than rubbing it, as is sometimes advised. The effect of frost-bite is something like that of a burn, a scar being left for a time, or the part turning black or the skin coming off. But in slight cases this does not happen. On sledge journeys some of the men got severe frost-bites, often in the feet, by getting them wet and not being able to change their stockings and boots. In this way several men in the "Alert" lost toes, or portions of them.

Now that cold and darkness were upon us we settled down quietly to our winter routine. At first the men were not sorry to lose the sun, as an extra glass of grog was to be served out daily till its return; however, they were as thankful as any one else when it appeared again. Every one was obliged to leave the ship daily for air and exercise. If no other employment could be found for the men, they were marched round the mile after divisions. Ice had to be brought for water, and the mile and rink kept clear of snow. Also the fire and tide holes had to be kept clear of ice. The fire-hole was an opening in the ice, near the ship, of about four feet square, its object being to provide water in case of fire breaking out; but this, happily, never occurred. The tide-hole was for measuring the rise and fall of the tide, and was under the stern of the ship. A graduated scale was placed in it, and the height of the tide noted at stated intervals. The temperature of the water was also observed. A quartermaster was always on the upper deck, and he broke the ice which formed on these holes every half-hour. But they gradually closed up from the sides, and had then to be cleared by cutting out the newly-formed block of ice. As it was three feet thick, this was tiresome work, whether pickaxes or ice-saws were used. Sometimes a tin of blasting-powder was placed beneath the ice, and then exploded, a large hole being thus readily formed. The temperature was observed by the officer who undertook that duty, twice in every twenty-four hours, one time being midnight. The thermometers were placed in a stand on shore, whither the observer went in all weathers, and the daily maxima and minima were always stated in the newspaper. So also of barometric observations. But the hardest work was that of the officers who worked in the magnetic and astronomical houses. To be out at all in such extreme cold is unpleasant, but to remain quietly working in it, observing and noting

results, requires a strong sense of duty, or great enthusiasm for science.

It will be seen that most of the officers were fully employed, but that the men had little work. We therefore had to get up different amusements to employ the time and banish idleness. We utilized all anniversaries. The observance of the Fifth of November has much declined since we were boys. But the old times were revived in more than pristine splendor on the ice in Discovery Bay on November 5, 1875. A guy was made and arrayed in black clothes suitable to a deed of darkness. His hair and whiskers were formed of tow, a pipe placed in his mouth, and a tin cup in his hand. At seven in the evening he was placed on a sledge outside the ship, and a procession was formed, headed by the band playing the "Conspirators' Chorus" from "Madame Angot." After them guy was drawn, an officer walking on each side of him, bearing a flag, and the ship's company brought up the rear. As it was quite dark blue-lights were burned to illuminate the scene, and they proved most effective. Having marched round the ship, the procession halted at the place of execution, where the first lieutenant delivered an oration, received with loud applause. The guy was placed on a large tar-barrel, filled with combustible matter, which was placed on some blocks of ice, and fired by the public executioner, who first despoiled the guy of his wide-awake hat, and placed it on his own head. This executioner was one of the most popular of the men, who is said to have once applied for Jack Ketch's billet, but to have been rejected as too young. The guy and barrel burnt well and brightly, lighting up the masts and rigging of the ship, illuminating the floe, and giving to the whole a singularly weird appearance. Finally, a 3-lb. tin of gunpowder which had been placed in the barrel, exploded with beautiful effect, and the guy was no more. Meanwhile, the band played, rockets were let off, and maroons discharged from a small brass mortar. Our indefatigable photographer tried to get a view of the scene, but this was found to be impossible. The ship's cook, an inimitable mimic, walked about amongst the crowd, shouting out well-known cries, "Ten a penny walnuts," "Two shies a penny," etc., and doing it to the life. One of the officers slipped quietly about, armed with a formidable truncheon, and apprehended several seemingly quiet and inoffensive individuals for having been seen with their hands in other people's pockets, and for being notoriously suspicious characters. Then the first lieutenant told everybody to join hands and dance round the fire, which was done by all, captain, chaplain and doctors not excepted. Waltzes and polkas followed, and a few of our most accomplished dancers did their best under the adverse conditions of duffel boots on ice. And then we had comic songs with roaring choruses, and jack-pudding tricks, such as eating burning pitch from the tar-barrel. It was well that the weather chanced to be comparatively warm, or loitering for two hours on the ice in an Arctic November night would have been rather chilly work. After the outdoor amusements, the officers had a sumptuous repast in the ward-room, the supper being mainly provided by the liberality of the captain and first lieutenant, and consisting of soup, tongues, brawn, and *pâté de foie gras;* also apricots, French plums, and all sorts of preserved fruits. Unlimited port, sherry, beer, and whisky were supplied — a rare event in those days of short allowances of liquor. Altogether, illuminated by numerous lamps, the scene was a most festive one, and all thoroughly enjoyed themselves. After supper, we adjourned to the steerage and surrounded the piano, and music and song were kept up till a late, or rather an early, hour.

But the chief festival of all was that of Christmas. We then enjoyed a week's amusement, the men having hardly any work, and concerts, plays, or something of the sort, occurring every day. A barrel of strong beer was broached and served out daily till it came to an end. Christmas-day was first announced by some of the choir singing carols in different parts of the ship; the usual prayers were read in the morning; and after that the officers made the round of the lower deck, admiring the decorations, tasting the men's pudding, and exchanging Christmas greetings with all. Huge boxes of toys for all hands, the presents having owner's name affixed, were then produced and distributed by the captain amidst shouts of laughter. The choir then sang suitable ballads, cheers were given, and the men commenced their dinner. The ward-room dinner later in the day was served in a style that would not have disgraced any mess, and the evening was passed in jollity, songs being sung, punch brewed, and choruses shouted; and all agreed that they had never passed a pleasanter Christmas-day.

A theatre was built of ice for plays, lectures, and concerts. It was on the floe close to the ship. The foundation stone

(a large block of ice) was laid with great ceremony on November 18. In the forenoon the mayor and corporation waited on the governor (the captain), and an address was read, setting forth the objects of the building, and praying him to lay the foundation. This was accordingly done in due form, coins having been placed beneath the stone. The civic authorities were hard put to it for suitable robes of office. The mayor appeared resplendent in dressing-gown, fez, and brass chain; the mace-bearer was also suitably attired, and the *corporation*, with pillow in his waistcoat, seemed fully conscious of his importance. The building of the theatre was not completed before the end of the month. It was made of blocks of ice, and roofed over by a sail. The length was twenty-seven feet by fifteen feet. The auditorium was of sufficient size to contain the whole ship's company. Raised above this by one step was the stage, provided with green-room and wings. Half-a-dozen footlights, and a few lamps with polished reflectors, were sufficient to light the whole building. It was finally opened on the evening of December 1, the birthday of the Princess of Wales, and named the "Royal Alexandra Theatre." The whole ship's company attended, the officers sitting in front of the stage, and the men, with their band, behind them. The manager first appeared on the stage, and read the prologue, an elegant classical composition suitable to the occasion, written in verse. A committee had selected it on the previous day from four, which had been submitted to their decision. The prologue being concluded, loud shouts of "author" were raised, and that gentleman appeared on the stage to receive well-merited applause. Then followed the amusing farce "My Turn Next," the parts being taken by five officers. On the whole the piece was very well performed; one actor in particular displayed considerable dramatic talent, happily introducing several local allusions. Much amusement was caused by a female character appearing in a black beard, the gentleman to whom that part had been allotted having obstinately refused to part with that protection against the cold. Songs, and recitations by some of the men followed, and the evening's entertainment was concluded by an original composition called "The Arctic Twins." This was the hit of the evening, and was sung and whistled everywhere for some time after. It was a dancing song, by two of the petty officers, who appeared in sledging-costume, and sang and danced, accompanied by the band. Thus satisfactorily closed our first evening in the theatre. We had many more such during the winter, sometimes the officers and at other times the men giving a representation. The plays were usually followed by songs, recitations, and dances, the songs being not unfrequently original, composed on passing events by some of the seamen and marines. Some evenings were devoted to lectures; and in particular one on Malta, which occupied two evenings, and in which its history, siege, knights, and present state were fully treated of, was most interesting to all. A magic lantern was also employed on several occasions. But when our first enthusiasm had subsided, we began to think sitting for hours in a temperature of —20° rather an infliction. For though the theatre had a small stove, and was always much warmer than the outer air, it was often as cold as —20°. So we commenced a series of Saturday evening concerts on the lower deck, and agreeably passed many a dull hour during the tedious four months' night.

All these little breaks in the monotony of our existence supplied matter for our newspaper, the *Discovery News*, of which eight or ten numbers appeared. Some of the articles and smaller contributions exhibited considerable wit and humor, but they were often ludicrously misunderstood by the men. For instance, a wag, who subscribed himself "A Cantankerous Correspondent," made several complaints, as that in other ships he had been able to go on shore but seldom, whereas now he could do so every day; that he had only received news by infrequent mails, whereas now he read the papers weekly; and that he had been accustomed to night watches, but now had every night in. One of the seamen was heard reading this effusion to his friends, and it cast a gloom over the whole party. They commenced speculating as to who the discontented person could be, and asking indignantly why he should try to make other people miserable as well as himself. At last one of them said: "Why there's the fire-hole; if he's tired of life, let him jump down there, and a good riddance too:" and to this decision they all agreed! The paper was edited by one of the officers, and printed by a seaman, who had learned a little printing in London a short time before our departure. The press was also of use for printing songs, recitations, and playbills. We had provided a number of games — lawn-tennis, hockey-sticks and balls, foils, masks, and boxing-gloves — but these returned

to England in the same state as they had left it. I tried fencing with another officer in the winter, but it would not do. We illuminated the ice theatre with a few candles, but could not see when we had the masks on. We therefore tried the gloves instead, but with no more success, for in extreme cold the breath forms a dense opaque vapor, and this at times completely masked one's opponent and his attack. I was disagreeably surprised by a heavy blow issuing from this cloud and smiting me on the nose, so, similarly concealed, I retaliated on my opponent's chest. We then slipped on the ice floor and fell prostrate on our faces, and were obliged to confess that the noble art is no amusement for an Arctic winter.

Besides amusements, a night school was set on foot, as a means of usefully occupying some of our vacant hours. Half of the men joined it, but gradually dropped off, as the novelty wore away. In fact, that was to be expected, as the modern seaman has been already well instructed in the training-ships. Moreover, the sail-room where we held the school, the only available place, was very uncomfortable, as there was a constant drip from the ceiling, which put out the candles and blotted the copybooks. Yet some resolutely went on, one gaining some knowledge of algebra, and two men who were learning to read being thankful for a lesson whenever they could get it. There were also choir practice for Sunday, recitations for the theatre, and many other ways of filling up the time. However, it cannot be denied that the winter proved very long, and we were glad when signs of returning day began to appear. This was some time before the appearance of the sun, for we could just see to read at noon on January 27, but the sun did not come above the horizon till the 26th of the next month.

This time of returning light was also our period of greatest cold; the temperature was usually about 70° or 80° below freezing, and, as I have before stated, on March 4 more than 100° below. Still it was most cheering to regain the daylight. We saw the first lemming of the year on the 2nd of February. They afterwards were seen very frequently. They are little animals, something between moles and mice. They burrow into the snow and make nests of grass. The color is white in the winter, but it changes to mouse-color about the middle of May. Their tracks in the snow, winding about and interlaced, are seen all over the land, and even out on the floe. They form the food of foxes and owls, and our dogs made but one mouthful of any unhappy lemming who had the misfortune to come within their reach.

On February 9 our hunter shot the first game of the season. He brought home three hares on that day, two the next day, and one the day after. Even this modicum of fresh meat was a treasure after months of incessant preserved, or (*horresco referens*) salt meat!

At last the long-expected 26th of February arrived, and all hands fell in at divisions in duffel clothes and canvas boots, and then proceeded to the hills overlooking Hall's Basin to see the sun rise. The men carried pickaxes and shovels, and with them grubbed up the frozen stones, and raised a large cairn on the crest of the hill, forming a conspicuous mark. We found it heavy walking, the snow being deep in the hollows, and frozen so hard on the hill-slopes that it was difficult to ascend them — sliding down again was quite another matter. But we were disappointed in our expectation of seeing the sun, and could not even obtain a good view, as the weather was thick and foggy; in fact, the sun did not appear till three days later. Our energetic photographer, who had taken so many views on our voyage northwards, now brought out his camera, and began taking the ship and surrounding houses from the floe and from the land. About this time walks, and short trips with the dog-sledge, commenced. Surveying officers were indefatigable in ascending hills to take bearings of prominent features of the country. In spite of the cold, these trips were enjoyable; one grew quite warm with the exercise, and on a fine day the views were magnificent. The deep blue of the sky was so beautiful that, combined with the glistening white hills, and the glorious flood of sunlight, it almost compensated for the absence of water and foliage. On the ice-foot cracks often appear, caused by the rising of the tide, and through these openings water flows over the surface of the ice-foot, which soon becomes frozen and very slippery. This is soon covered with ice-flowers, and little tufts of snow, resembling weeds or tufts of grass. From icebergs, ship, and houses, hang festoons of snow, something like the fruit of the lime-tree in form. The air is seen to be filled with minute particles of snow, which glisten in the bright sunlight, and there is a shimmer in the air above the ground and floe, such as one sees over the shingle at Brighton on a hot summer's day.

In the middle of March Hans caught a fox, the first that we had obtained. The Esquimaux take them in stone traps, but they are very wary animals, and, though there were signs of the presence of a number of them near our winter quarters, we saw very few, and obtained still fewer. This one had beautiful long white fur, but one shot in the summer had a brown coat. Our first fox was hashed and eaten for breakfast, and was passable — nothing more. Arctic foxes are very much less than English ones, not being larger than hares. Soon after the sunrise, we enjoyed perpetual daylight; in fact, two or three weeks after the sun first appeared the thermometers could be read at midnight by natural light.

We were still going on in the same humdrum fashion when we were astonished, on March 25, by the arrival of a sledge from the "Alert." It was drawn by seven dogs, and accompanied by the officer who left us in the autumn, one of the "Alert's" officers, and two seamen. They had left the "Alert" on the morning of the 20th with the glass at —34°, so that they had had a cold journey. Still, beyond a slight case of frost-bite, they were all perfectly well, and reported that the dogs had worked famously. They had attempted to reach us a week previously, having left the "Alert" on the 12th; but the wind was blowing, and the glass as low as —45°, and after a day or two Petersen, the Danish interpreter, who was one of the party, was severely frost-bitten, and they had to return with him to the ship. They were with difficulty able to get him back alive, which they did on the evening of the 15th. (This poor fellow suffered amputation of parts of each foot and of the nose, and, though every care was taken of him, his life could not be saved. He lingered for a long time and then died, and was buried at the "Alert's" winter quarters.) Of course we were most eager to hear news of our comrades in the sister ship, and, I am afraid, did not allow the new arrivals to shift and enjoy dinner in peace. It appeared that the "Alert" had been stopped by heavy ice a few days after leaving us in the previous year. She wintered on the same coast as we did in lat. 82° 27m. N., long. 61° 22m. W., the distance between the two ships by the road taken being a little more than fifty miles. The ice to the north of the "Alert" was so heavy that a ship could not possibly proceed further in that direction. They also saw no land to the north, but the trend of the land was east and west. They had evidently got to the end of the land to the north; vegetable and animal life had almost died out there. They had shot but three musk-oxen and four or five hares. Also the land about them was very flat and uninteresting. They had attempted more sledging than we in the autumn, and a number of cases of frost-bite in the feet had occurred, caused by getting them wet. Thus several men had lost parts of toes. Putting these mishaps on one side, all were well, with the exception of poor Petersen, and looking forward to the approaching sledging. Their winter had been spent in much the same way as our own.

Our preparations for sledging now began in earnest, crews being told off for each sledge, and the sledges and sledging gear overhauled. The men were busied in their spare time in marking and mending their clothes and personal fittings.

Our first sledge party left three days after news had reached us from the "Alert." This was an excursion with dog-sledge to Polaris Bay, to take stock of the stores left there by the United States steamship "Polaris." These stores had been placed at our disposal by the American government. The sledge party consisted of two officers, two seamen, and the Esquimaux Hans as dog-driver. They were only a week away, having taken three days to reach Thank God Harbor, but a day and a half only to return. They had cold weather, and in going had one windy night on the floe. But they found a wooden house at their destination, which they cleared of snow after half a day's labor. Here they found abundance of biscuit, besides hams, bacon, preserved meats, pemmican, and molasses. Captain Hall's grave, with tablet made of a cabin-door, looked quite fresh. A copper cylinder, containing records left by Captain Buddington, was dug up. The party saw little worthy of note besides — no open water or signs of animal life, with the exception of a bear's track. The ice in the centre of the channel was found to be comparatively free from snow, and therefore good travelling.

Two days after this sledge's departure the "Alert's" party set out on their return journey, having had four days' rest. All hands turned out and gave them three parting cheers, and most of the officers accompanied them for some miles. The dogs pulled splendidly, though they drew 76 lbs. each. Some one must walk in front of them to show the way; but they are very willing, and need little driving. If they are given a rest, they lie down and

roll on their backs in the snow for a minute, and then jump up and go on again without being told to. However, they know when they must give in. If the sledge sticks fast against ice or in deep snow, they immediately lie down and wait till it is liberated for them, when they at once go on again. The dogs are harnessed to the sledge by light leather thongs, and arranged all abreast, not two and two, as in Siberia. We travelled along the ice-foot till out of Discovery Bay; but after a short time the ice-foot in Hall's Basin was left, and we struck off over the floe to Distant Cape. On reaching the middle of Watercourse Bay, after passing the cape, we gave three cheers, and parted from our friends. We had been pretty warm, as the dogs kept us walking at a smart pace, and the wind had been at our backs. But now we struck overland to make a short cut of five miles to the ship, and had the wind in our teeth. Our road lay through the valleys, in which the snow is deeper than on the hills. We were often up to our knees or deeper in snow, which made walking very laborious. The snow was blown into our faces by the wind, and frost-bites kept on appearing — hardly had one been removed by the warmth of the hands, when another would break out somewhere else. We thus gained a slight idea of the discomforts of sledging in cold weather, and felt for our friends who would have to spend the night in tents on the windy floe.

I may here describe the equipments of a sledge party. First, comes the sledge itself, which is made of Canadian elm. It is constructed strongly and lightly, and is raised about a foot above the ground by the runners, which are shod with iron. The sledge is drawn by a drag-rope, to which the sledge's crew are attached by rueraddies, or ropes which pass over their shoulders. The men walk two and two, with a leader at the angle of the drag-rope if they form an odd number. On the sledge the tent, bedding, clothing, and provisions are placed, the tent covering all, and being firmly lashed to the sledge with ropes. A sledge crew consists of five or eight men, including the officers. We had one twelve-man sledge. Each sledge has its own tent, which is just large enough for all the crew to sleep in. The breadth of a tent is little more than six feet. There is a small canvas porch at the entrance, in which is placed the cooking apparatus, and here the cook for the day prepares the meals. A waterproof sheet forms the floor of the tent. On this the duffel sleeping-bags are arranged, parallel to each other, across the tent. At night a thick coverlet is spread over the whole. Each man has a canvas knapsack, in which he keeps a change of under-clothing in case of a wetting. He also has duffel coat and trousers, but these are too heavy for travelling in, and are used in the tents only. The day's work is done in warm under-clothing, covered by a thick grey guernsey, a loose canvas suit being put on over all. The feet are protected from the cold by blanket wrappers, and canvas boots or mocassins are worn over them. Horn spectacles with colored glass are worn on a journey to guard against snow-blindness; but cases of this unpleasant disorder often occur, in spite of all precautions. The daily ration per man consisted of one pound of pemmican, fourteen ounces of biscuit, six ounces of bacon, a pint of cocoa, a pint of tea, and a quarter of a gill of rum. A small quantity of stearine was provided for cooking. The cook for the day had no sinecure, as he had to rise a couple of hours before the other men to light the fire, and make cocoa or pemmican for breakfast. When these were ready he would serve the pemmican to the men in metal pannikins holding a pint each. The men were all provided with one of these, and also with a huge horn spoon. The pemmican finished, the pannikins were passed out to the cook, and returned full of cocoa. At lunch bacon and tea had to be prepared, and after the day's work the unhappy cook had again to melt snow to make tea, and to cook more pemmican. Grog was given as the last thing, after which all would endeavor to forget the cold in sleep, but often with indifferent success.

A couple of evenings after the departure of the "Alert's" sledge, the captain read a lecture by Captain Nares to the ship's company on the lower deck. The men employed the time in sewing and preparing their clothes for sledging. This lecture had been delivered by Captain Nares in the "Alert." It explained the objects of the expedition, the work already accomplished, and the approaching sledging; many practical hints as to clothing, and precautions against frost-bite and snow-blindness being introduced.

A few days after this all was ready, the ship's company being divided into two parties. The first of these, under the first lieutenant and Dr. Coppinger, started on April 6. This expedition's work was the exploration of the Greenland coast. The party consisted of two sledges, with eight

men each. They were to proceed to the "Alert," where they would find a third eight-man sledge belonging to our ship, which had been in the "Alert" since the previous autumn. The whole party would then cross over to the east side of Robeson Channel, and explore as much of the coast as possible to the northward. The photographers took a photograph of the sledges and their crews, as they stood on the floe ready for a start. The sledges looked gay with their silk flags fluttering in the breeze, and hearty cheers were given, as they left the ship, by their messmates who stayed behind. The officers accompanied the party on the ice-foot for several miles. We afterwards heard that they reached the "Alert" after a journey of twelve days; and, having enjoyed a short rest, proceeded across the floe towards Greenland. But of this anon.

Two days later started the second party to explore Lady Franklin's Strait. This party consisted of a twelve-man and an eight-man sledge, the former being intended to support the latter, and to return to the ship when their provisions were exhausted. The captain accompanied this expedition for several days, taking a dog-sledge, and not returning for a week. After twelve days' absence the large sledge returned to the ship, being damaged. They had experienced some very cold weather, the glass one night having shown —40°. One man was severely frost-bitten in the heel, and had been dragged on the sledge for the last two days. They had seen about a dozen hares on Expedition Island, a few miles from the ship. The hares were sporting on a sunny slope, and they had shot two of them, which they brought to the ship. The other sledge returned on May 2, having been absent twenty-four days, and completed the survey of Lady Franklin's Bay. It proved to be a fiord nearly sixty miles deep, surrounded by high mountains, which could only be descended in places, and that by the branch fiords. Lieut. Archer ascended a mountain of thirty-eight hundred feet high, but spoke of yet higher points. Three glaciers and a *mer de glace* were seen. Large rocks were found on the ice, sometimes at a considerable distance from the base of the mountains, so that it was necessary to encamp well out from shore to be safe from stones rolling from the cliffs. Thirteen musk-oxen were seen, the first this year; but they were very wild, and, when followed, took to the mountains, and ascended to the top, sending the large loose stones over which they walked rolling down the mountain-side. With the exception of a couple of hares, no game had been shot. One of the men was badly frost-bitten in the nose, which was quite black. With this slight exception all were perfectly well.

A couple of days after this party's arrival the dog-sledge returned from the "Alert." It had set out sixteen days before. We thus obtained news about the "Alert," but it was too early to learn the success of their sledging parties. A few days after the eight and twelve man sledges set out for Polaris Bay. They started at eight in the evening, intending to travel by night, so as to avoid the full glare of the sun. Their object was to take supplies, which would be left for the North Greenland party at Hall's Rest. They also took a life-boat, to transport that party across the channel in case they should not be able to cross before the floe had broken up. Several days after this the dog-sledge followed, and caught up this party. The 18th of May was pleasantly warm, the sun having great power, and even the air being as warm as 18°. About six o'clock in the evening three sledges, with about thirty men, returned from Polaris Bay. Two officers and two men had remained there with the dog-sledge, to lay out dépôts to assist the north Greenland party, and then to attempt the exploration of Petermann Fiord, which is a little to the south of Hall's Rest. The men were very tired when they reached the ship, as they had made a day's march of twenty miles, having started at seven in the morning. They had left Hall's Rest on the morning of the previous day. One man, who was prevented from walking by a strain, was dragged on a sledge, and four others were snow-blind. The party had been detained for five days at Hall's Rest by a strong wind, during which time they remained sheltered in their tents, hardly any one caring to venture out. Yet some interesting fossils and geological specimens were picked up. A five-man sledge, which had been detached from the north Greenland party, met the sledges from the ship on their arrival at Hall's Rest, and they all returned together. Three of these men had been in the "Alert" all the winter. They had left the north Greenland party, consisting of a large and a small sledge, on May 5, at a place called Cape Stanton. These sledges were still journeying northwards, but with difficulty, the travelling being excessively rough. In some places the number of hummocks presented a very

serious obstacle, and it was difficult to select the right path. Thus in seven days they had only made twenty miles, and that with great labor. The returning sledge had found some things which had been left at Cape Sumner by Captain Hall, of the "Polaris." There were two boats and some muskets. They brought away two Remington rifles, the barrels covered with leather as a protection against the cold metal. At Cape Brevoort a copper cylinder was dug up, containing a record left by Captain Hall, in which he spoke of seeing an appearance to the northward which *might* be land. Our people had taken with them from the ship a beautiful little monument in memory of Captain Hall, having an inscription on a brass plate. This they erected on his grave; it had been brought from England on purpose. Four days after this party's return a five-man sledge set out for the "Alert." This was on the evening of May 22. We did not see them again till the "Alert" joined us some months after.

As I have already stated, our coldest weather was in the month of March: it began to grow warmer in April, and the end of May was the period of the sun's greatest power. The awning was removed from the upper deck on April 3, and the snow shovelled from the engine-room skylight. This enabled the sun to shine on the deck during the day, yet at night the glass often showed more than 70° below freezing. But on April 26 the temperature reached 4°, and some of us ventured to dig the snow away from our skylights, so as to let daylight into our cabins. On May 5 we tried the experiment of shovelling the snow off part of the deck, but the effect was to materially lower the temperature of that part of the ship, so the rest was allowed to remain a fortnight longer, till the glass had attained a maximum of 18°. But the sun had so much power in the daytime that the ice-houses were fast melting away, and already presented a very dilapidated appearance. The returning warmth gradually brought back more signs of animal life. A ptarmigan was shot on April 10, and it was in good condition, its crop being full of young grass shoots and other sprigs of herbage. It was still white, but beginning to change color, for it had some black feathers in its tail and about the eyes, and a few yellowish-brown ones on the breast. Our Esquimaux shot two more a month afterwards, but as he struck them in the body with bullets they were nearly annihilated. They were sitting together on the snow-covered hillside, and allowed him to approach close to them, and fire away till he hit them. We obtained a few more of these birds during the next two months, but they were never numerous.

On May 16 the pretty little black-and-white snow-buntings, which are so common in the Arctic regions, made their first appearance, and two days after a couple of snowy owls were seen sailing majestically along through the air. On May 23 one was astonished to see a caterpillar, covered with long hair, crawling over the snow. These became exceedingly common, especially after the thaw. Of course one found a number of cocoons, the chrysalis frequently devoured by insects. The butterflies were all of the same sort, brownish in color and rather small. A few seals began to make their appearance, now that the ice had opened in places near the land and permitted them to rise and breathe. The fire-hole near the ship was a favorite place with them, and here several met their fate. The Esquimaux shot one there on May 8 and another on the 23rd. As the seal lay bleeding on the floe one of the men who had a touch of scurvy was seen scooping up the blood with an old meat-tin and drinking it. He declared that in flavor it resembled milk, and I believe that it is an excellent remedy for scurvy. The Esquimaux are most careful to preserve the seal's blood. They carry plugs with them to stop the bullet-holes when they have shot one. But very few seals were seen, and they were exceedingly shy. They make a circular hole in the ice, where they rise to breathe, and on a sunny day they lie near it, and bask and sleep in the sunshine. The Esquimaux stalk them by crawling over the snow, hidden behind a small white screen. Having a strong desire for fresh meat, we tried seal steaks and liver, and were astonished to find them excellent juicy meat. The flesh is very black, and somewhat resembles beef in flavor. I afterwards found seal mentioned, in Mr. Froude's "History of England," as having formed one of the dishes at the installation banquet of George Neville, archbishop of York and brother of the Kingmaker. But I confess that I should prefer English roast beef.

By the end of May the weather was quite warm — 120° in the sun and 69° in the shade beneath a glass frame. Encouraged by this, we commenced to make a garden. The ground was very stony, but by using the pick for an hour or two a pretty good bed of forty square feet was prepared. This was sown with cress, and

covered by a glass frame. In four or five weeks' time there was a nice crop of green meat, enough to give several meals to all on board. A little cress had been grown in the ship during the winter in a wooden box full of earth; but being grown in the dark, it had a yellow, sickly appearance.

The sun did not melt the snow till June, but when the thaw had once set in it was very rapid. The land became marshy and muddy, especially in the valleys; and rapid streams, becoming continually larger and larger, rushed down the watercourses with which the hills are furrowed till they reached the sea. Some of these streams, or rivers, as we called them, were several feet deep in places, and of considerable breadth. One boisterous torrent, rushing madly through a narrow gorge in the rocky hills, formed a fine waterfall, the roar of whose waters could be heard for miles. So great was the force of the water that another stream left its old course, and tunnelled a passage through the frozen cliff of earth which formed one of its boundaries, coming out at length into the old channel.

As the ground was uncovered by the disappearance of the snow, patches of herbage appeared, but for the most part very brown and dry. But on some well-watered slopes one saw velvety green or red moss. Dwarf willows and grass are the most common plants, the former creeping on the ground like ivy. The bright red saxifrage enlivened some favored spots, and forty or fifty different varieties of plants were discovered.

With the exception of a few hares and one or two ptarmigan, we did not get any game till the middle of June. A small shooting party left the ship on the 6th, and returned a week later, but they hardly shot anything. They went to the head of St. Patrick's Bay, which opens out of Robeson Channel, and is a few miles north of the ship. The party only consisted of two officers and three men. They took a five-man tent and rations for eight days, and the dog-sledge carried their gear, returning with its driver next day. As the ground was then covered with snow, and the travelling overland very heavy, especially up-hill, where it is sometimes almost impossible to get a footing on the slippery hard snow, a halt had to be called after a short time, and fresh hands fetched from the ship to assist. Dogs and men had a severe day's work, not reaching their destination till six in the evening. In one valley we crossed a lake of more than a mile in length, but the thick coating of snow over land and water gave everything so uniform an appearance that no one would have suspected the lake's existence if we had not remarked it in the previous autumn. This party went rather too early. Still some geological specimens were obtained, and a few hares shot. The dog-sledge fetched the party home on the 13th. About this time brent geese and eider ducks made their appearance, and some of the men would obtain leave to take a gun in the evening and try their luck. They often returned with several fine birds for the good of their mess. On the 15th a snowy owl was shot, and her nest of nine eggs taken. The nest, however, is of the scantiest; these owls laying their eggs on the ground, with only a few feathers as protection. A lot of dead lemmings are found round an owl's nest, placed there by the cock bird for the use of the hen, who sits on the eggs. On the 16th two of the men came across a couple of musk-oxen — young bulls. They shot one and wounded the other, which escaped, as they had no more ammunition. We were delighted to hear of this, as it was the first beef of the season, and a sledge was sent next day to drag home the game. On June 23 another shooting party set out in a new direction. It consisted of three officers and two men, and was absent about ten days. Our tent and other gear were carried on a dog-sledge, and the first four miles lay over the floe. This was already wet travelling, as the surface snow had melted, forming large pools. But being provided with knee-boots, we did not mind this. The dogs, however, have a great aversion to the water. It is curious to watch how the leader will turn aside to avoid a pool, the others obediently following. At the ice-foot the ice was much broken, and we had some difficulty in gaining the shore. We found a place where the ground-ice was a couple of feet lower than the floe, and separated from it by a channel of water six or eight feet wide. The dogs were made to jump this, going souse in the water and swimming out on the other side, and the sledge was easily shoved over after them. Travelling over the floe was easy work, but on land, where the snow had disappeared and left thick mud, it was a difficult matter. We were obliged to partially unload the sledge, and carry the things piecemeal on our shoulders. We shot some geese and found an owl's nest on our way, but as most of the eggs were already hatched we left it for another time. We now came to a large lake, a couple of miles long at

least, covered with ice. This ice was completely broken away from the shore, and we had to find a ford by which to gain the ice, and another to leave it on the other side. The surface ice was melted by the sun, and covered with sharp edges, — it was just like a honeycomb, in fact. This caused the dogs much suffering, as it cut their feet, and one of them had a fit. But this is a common occurrence with Esquimaux dogs. I believe that the Esquimaux cover the dogs' feet with little leather shoes when they travel over rough ice.

We reached the far side of the lake in the evening, and pitched our tent, a breeze of wind blowing it down again, but at last it was set up all right. The floor-cloth was then spread, and on this the duffel sleeping-bags, and we commenced changing our wet clothes for dry ones from our knapsacks, hanging the others outside the tent to dry. The dogs were fed and picketed, and lay down to sleep. Our cook lit the fire in the cooking-stove in the tent's porch, and prepared our evening meal of preserved meat and potatoes, which we ate with huge horn spoons, using the tin covers of old preserved-meat cans as plates. A pint of tea in pewter pannikins followed, after which they were washed out and replenished with grog, and after a game of whist and a chat we settled ourselves to rest. The cook, who stayed in charge of the tent during the daytime whilst we were away shooting, was the drollest fat little fellow that ever was seen. He did all the talking in the evening, telling "Canterbury Tales," he having been brought up in that city; and I hope Chaucer gave his contemporaries as much amusement as we derived from our cook in the Arctic regions.

Next morning we sent the sledge and dogs back to the ship, after a breakfast similar to the dinner of the previous day. We sent back half-a-dozen geese for our friends on board. Then we performed our scanty ablutions at an icy mountain stream which flowed past the tent on its way to the lake. After this we filled our pockets with cartridges, taking also bacon and biscuit for lunch, not forgetting a small drop of rum to wash it down, and started up the valley to try for game. A river ran through this valley, connecting our lake with others higher up. Through this river we had sometimes to wade to reach the geese, and we soon were accustomed to wet feet and legs, though snow-water is rather chilly. We soon shot a number of geese, and took a lot of their nests. These are found on low marshy ground near the streams, and are beautifully made of the down from the breast of the hen. The eggs were all blown and kept as specimens, the contents being fried with bacon, or even made into egg-flip, as a little whisky was found in one of the flasks; and we unanimously decided that egg-flip must have been the Olympian nectar of antiquity. We not only found geese, but also a number of hares; and everything that showed itself was knocked over and buried in an ice-house near our tent. We found a nest of nine young hares, which proved as toothsome as the old ones. One of them we kept alive in the tent for some days, till it met with an accident and died. The young hares are of the same color as an English rabbit; half-grown leverets are a mixture of russet and white, and they are perfectly white by the time that they are full grown. After two or three days we came close up to a young musk-ox, which was instantly despatched by two well-directed bullets. My friends continued their walk, and shot some geese. I returned to the tent, three miles off, and fetched the men who were there. We brought with us saws and choppers, and cut up the musk-ox, and found that it was the one that had been wounded not a fortnight before. It had three bullets in it, in addition to those that we had fired. One of these had broken its jaw and gone clean through the tongue. Yet all the wounds had healed, and the animal appeared to be grazing quite comfortably. We cut the whole animal into six parts — two shoulders, two hind quarters, and two sides, and staggered back, each carrying his share.

Next morning I returned to the ship, shooting two brent geese on the way. Arrived at the sea, I found the floe rapidly breaking up near the shore. Cautiously stalking some eider ducks, and unfortunately treading on a detached floe-piece, to my horror I found myself in the water. Having first secured the safety of my gun by throwing it on to the floe, I with some difficulty managed to scramble out myself. About this time two of our party, meeting with a similar accident, were not fortunate enough to save their pieces. I was singularly lucky in this respect, having fallen into the water twice during the previous autumn, and saved my rifle on each occasion. Oh, the luxury of a bath and dry clothes on reaching the ship! One heard no news, except that a musk-ox had been shot on the crest of a deep ravine. It fell more than a thousand feet on to the rocks

below, and every bone was broken. Next day I returned to the tent with dog-sledge and driver, shooting a musk-ox on the way, after an exciting chase. Having enjoyed another day's sport, I transported the game already shot to the ship by dog-sledge, crossing lake and sea with difficulty, the ice being so much broken up. A day or two after the rest of the party returned, their hunting-ground being by this time entirely denuded of game. On their way they took from the nest some young owls, already half grown; these we kept in cages for some months, but they all died at sea from exposure to wet and bad weather.

A large cairn thirty feet in height was constructed at this time under the direction of one of the engineers. It was formed of preserved-meat tins and oil-cans filled with earth, and stood on the shore close to the ship's anchorage, to mark the position of our winter quarters — the ship's name, the date and other particulars of our stay being inscribed thereon.

A bitch having littered five pups, died a day or two afterwards, and left a helpless progeny; these we resolved to raise by hand, employing bottle and preserved milk, and appointing Dougall the quartermaster head nurse, to his intense disgust. But they did not thrive under artificial treatment, their bodies increasing while their legs remained the same size; being landed some time after, they were torn to pieces and devoured by the dogs, who failed to recognize them as brethren. We were more fortunate in a litter born a month before these, whose mother brought them up with great care, instructing them assiduously in the art of lemming-hunting; but they all eventually came to grief, some falling overboard on our voyage to the southward, and the last dying between Queenstown and Portsmouth.

On July 10 a tent was pitched on Cairn Hill, and two men stationed there with a large telescope to look out for the "Alert," the sledge party from Polaris Bay, and also musk-oxen. A flagstaff was raised on a brow within sight of the ship, and a series of signals arranged. This tent also served as sanatorium for invalids who needed mountain air. Five days later Lieut. Fulford arrived from Polaris Bay, with two men and a dog-sledge, having crossed the broken floe with difficulty, if not danger, all of them having been immersed by falling through holes in the ice. He brought news of sad disaster, narrating the death of two of the north Greenland party from scurvy, and of extreme suffering of the rest from the same disease. He, with Dr. Coppinger, the Esquimaux, and a seaman, taking the dog-sledge, had attempted the exploration of Petermann Fiord; but had been unable to proceed up it more than eighteen miles, being stopped by glacier ice, rendered perfectly impassable by deep crevasses. They therefore returned to Polaris Bay, which they reached on June 7, and were astonished to find a tent pitched there, the north Greenland party not being due till a week later. Lieutenant Rawson came out to meet them. His first words were, "Hand is dead!" He went on to say that he had been detached with three men from Lieutenant Beaumont's party to carry Hand, sick of scurvy, either to the "Alert" or Polaris Bay. This was on May 10, and they did not reach their destination, Polaris Bay, until June 3. On the way Bryant, one of the strongest and pleasantest men in the ship, utterly broke down. Being told to place himself on the sledge, he said, "I don't want to disobey orders, sir, but I'm not going to let you drag me." Next day, however, being unable to stand, he could resist no longer. Soon after O'Regan, a stalwart native of Cork, became crippled with scurvy, and could with difficulty drag himself along. Their distress was increased during the last few days by food falling short, the journey proving longer than had been expected, and but for the sick men's appetites failing them the party would have been reduced to a state bordering on starvation. Hand was brought in in a moribund condition, and died peacefully in the course of a few hours. The state of Bryant was critical, but he gradually began to improve. The arrival of Dr. Coppinger was most opportune; he promptly took in hand the scurvy-stricken sufferers, giving them strong lime-juice, molasses, cornflower, blancmange, and rum, which were found amongst the American stores. Hans was able to shoot some seals, the meat and soup from which were excellent and most nutritious. The officers shot a few geese and ducks, but as cartridges were scarce they did not fire unless certain of their aim, and latterly only when they could get two birds in a line.

No special anxiety was felt for the safety of Lieutenant Beaumont's party, they being provisioned up to June 28; but Dr. Coppinger, Lieutenant Rawson, and Hans the Esquimaux took an eight-dog sledge, provisioned for sixteen days, with lime-juice and other antidotes and remedies for scurvy. This relief party set out on June

22, and on the 25th came up with Lieutenant Beaumont's party in a state of great exhaustion. Three seamen and a marine artilleryman were utterly prostrated, and had to be drawn by the remaining three — themselves much exhausted — two at a time. The whole party was suffering from scurvy. They had traced the Greenland coast to the north-east for sixty miles, as far as Cape Britannia, whence land was seen trending to the eastward. On their return journey, they had been compelled to cast away all superfluous gear — clothes, portions of the tent, instruments, and even knives, to such weakness were they reduced by disease. Their joy at seeing the relief party can hardly be imagined. It was resolved to halt here whilst Hans hunted for seals; but he finding it impossible to obtain any, after a day's delay, the journey to Polaris Bay was continued. Twelve miles from home Paul and Jenkins, the two worst cases, were comfortably bedded on the sledge, and drawn to Polaris Bay by the dogs in twelve hours, scarcely any halt being called on the road. The men seemed little exhausted by this long journey, and enjoyed a good meal of seal-soup and blancmange; but the next morning Paul began to sink, and died the same evening. The other man, Jenkins, though nearly as ill, ultimately recovered. The remainder of the party arrived on July 1. Dr. Coppinger treated the sick with great assiduity and skill, sleeping in a tent with the three worst cases, carrying them into the open air in the daytime, and placing them on couches in the sunshine. Funeral services were read over the graves of Paul and Hand, the one by Lieutenant Beaumont and the other by Dr. Coppinger; their graves were adorned, as well as might be, by bright red saxifrage being planted over them.

On July 12, Lieutenant Fulford started for the "Discovery," leaving at Polaris Bay seven sick men and four fit for duty, and arriving at the ship, as I have before stated, on the 15th. The captain immediately set about preparing a relief party, a sledge and a boat being loaded with suitable food, wine, and medical comforts, the seven strongest men in the ship being told off to accompany him to Polaris Bay next morning. That Sunday there was no service on board, every one assisting in dragging the sledge and boat placed on our light wagon over the land to Watercourse Bay, a distance of about four miles. This proved a heavy day's work. Arrived at the sea, the boat ferried first the sledge, and then its crew across the open water in-shore on to the floe. A boat was now essential for sledge travelling, there being so many wide rifts in the floe.

Two days after Mr. Hart the naturalist and I, being out for a long walk, had occasion to pass down the long, weird gorge leading to Watercourse Bay. A rapid stream of snow-water dashes madly along the bottom, and through this we had to wade. After a time we arrived at Chattel's Cave, so called after one of our seamen. This was an immense low bridge, hundreds of feet long, spanning the ravine, and formed of drift snow which had slid down the mountain-sides in course of years. A little after, though we could scarcely believe our eyes, we saw before us in the stream a large lump of coal. Advancing farther, we saw a stratum of coal, twenty-five feet in thickness, in the bottom of the cliff which rose from the bed of the stream. We were able to break off the coal with our hands as we stood in the river, and large masses of coal lay in the bed of the stream. This was an astounding discovery, we having been within three miles of it for nearly a year without finding it. We appointed one of the engineers as chief-engineer of our coal-mine on our return, enjoining secrecy and showing him a specimen. Two days after we went again to the coal-mine provided with wood, paper, and matches. On my way, walking some distance before my friends, I slipped and fell into the bed of the stream, wetting myself completely. I immediately stripped, and commenced wringing my clothes dry, for snow-water is too chilly for comfort. In the midst of this operation I was conscious of screams of laughter higher up the stream. My friends had discovered my occupation, and gave me little comfort in my misfortune, and it was long before I heard the last of this little mishap. We lit a fire with difficulty, but when it once *did* burn it was splendid. The coal, similar in quality to the best Welsh, burnt with a clear flame and blue smoke. It is unfortunate that we were unable to utilize it, the distance being too great for transportation at that time of year. We stood round the fire for hours, heaping huge blocks of coal on to it, and making an enormous bonfire.

On the 20th of July, the ice being now broken up in the harbor, the ship was cleared of ice by blasting, and floated once more freely after more than ten months' imprisonment. But the quartermasters had to be always on the look-out,

as heavy pieces of floe frequently drifted foul of the ship or chain cable, and had to be blasted to get rid of them. An ermine or stoat of a dark color was shot about this time, and another was shot at Polaris Bay. From little salmonoids that had been seen in the lake near Musk-Ox Bay we fancied that larger fish might exist there. Going thither in a boat on August 1, with dredges and collapsable boat, we, after some labor, obtained half-a-dozen salmon-trout, the largest weighing between one and two lbs. These were interesting to the naturalist, but we could not catch enough for practical use. Curious marine animals were found by dredging in the sea, starfish, crinoids, and shrimps being the most common.

On August 3 the captain returned from Polaris Bay, bringing a few of Lieutenant Beaumont's men with him, and leaving the rest to be more perfectly healed by the careful treatment of Dr. Coppinger. The passage of the floe had been made with great difficulty. Three days later Sub-Lieutenant Egerton arrived from the "Alert." She had left her winter quarters on the last day of July, and worked her way down the coast with difficulty to within ten miles of our ship. Captain Nares had decided that, as nothing was to be gained by remaining out longer, an attempt should be made to return home at once.

This caused universal joy, and all began most willingly to prepare for sea, bringing stores on board and getting everything into shipshape.

A day or two after Lieutenant Rawson, coming from the "Alert" with two men, met a couple of musk-oxen. He had no rifle, but had no notion of sparing them. He managed to separate them so that they could not mutually defend each other, and then attacked one with his knife, which he had lashed on to his alpenstock. He managed adroitly to evade the charge whenever it was made, the men assisting by throwing stones into the beast's eyes. As it passed him he stabbed it in the side, and after a few such wounds it fell down dead. The other ox, though wounded, managed to escape. It was a more useful and, I should say, more exciting battle than a Spanish bull-fight.

On August 11 the "Alert" entered our harbor and anchored alongside the "Discovery." A few days before she had grounded on the shore, and the receding tide had left her high and dry; they were at one time doubtful about getting her off again, but it was managed by skill and determination. Some old Esquimaux remains had been discovered on the coast midway between the "Alert" and the "Discovery's" winter quarters. These consisted of stone huts, fox-traps and such like. The Esquimaux to the south have a tradition that a long time ago some of their people migrated northwards, but found a paucity of seals and no sufficient sustenance. Anxiety was felt at the non-appearance of Lieutenant Beaumont's party, as the ice in the channel had now broken up; Captain Nares left more than twenty of his invalids in the "Discovery," borrowed some of our able-bodied men, and attempted to go out into the channel in search of the missing party. This they were unable to do, the ice keeping them close to the breakwater at the entrance of the harbor. However, the sledge party reached them in a day or two, viz. on August 14. They had been drifted on the ice to the westward, as we had feared, and with difficulty were able to make the "Alert." Lieutenant Beaumont, Dr. Coppinger, and some of the men had been absent from the ship 132 days, during which time, with the exception of one or two days in the "Alert," they had lived entirely under canvas. Lieutenant Beaumont's sledge party had had continuous and heavy sledging work, with a total lack of fresh meat, for near upon three months, which fully accounts for their sufferings. We were overjoyed to welcome them home again; their feelings of thankfulness were too much for words.

After a few ineffectual essays we escaped from our winter quarters on the morning of Sunday, August 20, passed without much difficulty through the loose ice, and finally gained open water on the west side of Kennedy Channel. We had been in Discovery Bay one whole year, with the exception of five days. That day every one was hilarious, the ice quartermaster prophesying no further obstructions, but a clear and speedy passage home. However, at seven next morning we were stopped by the floe in Scoresby Bay, to which we anchored. For nearly three weeks our progress was much impeded by the ice; some days we could only advance two or three miles, and on others not at all. The ice began to form thickly round the ship at times, and we began to fear that we were frozen up for the winter. Sometimes a nip had to be forced by charging it again and again at full speed, the good ship rising to the ice and crushing it with her weight. Tins of blasting powder were used to break up the ice, and once or twice all hands from

both ships, armed with long poles called ice-points, turned out on the ice, and literally made a channel for the ships, by pushing loose pieces of ice out of the way. The coast in these parts was bare and uninviting in the extreme, covered with snow, and showing hardly any signs of life; yet some few hares and ducks were shot, and the Esquimaux obtained a few seals. One of these, shot in Hayes' Sound, had a harpoon-head in its side, the same as that used by the natives of Proven, Upernivik, and the other settlements. It must have been speared, escaped, and travelled hundreds of miles northwards. More Esquimaux remains were observed on the coast at the beginning of September. It then showed signs of growing dark at night, and the first star was seen at midnight on the 6th.

At length we got clear of the ice and reached Cape Isabella, the southern point of Hayes' Sound, on the evening of the 9th. Here we found papers and a few letters left by the "Pandora" in a rum-cask. We were much interested by the accounts of the Prince of Wales's tour in India, and earnest discussions were held as to the probability of a European war. The sea became rather rough, and for some reason most of us felt more or less of sea-sickness, some having never experienced the feeling before. On the 12th we lay for some hours close to the Tyndall Glacier, the ice at the foot of the glacier, where it runs into the sea, rising at least forty feet above its surface and forming a perpendicular cliff. Some Esquimaux were seen near here with dogs and sledges, but the sea being rough we were not able to visit them by means of boats. We beat about for a long time, never getting a fair wind, the weather very rough, and being reduced to the greatest straits for want of coal. The magnetic observatory, spare planks, all empty cases, and even pork were sent down to the stoke-hole as fuel. At one time we found ourselves close to the land, between Lancaster Sound and Ponds Bay. Sometimes we towed the "Alert," and at other times she towed us — anything to economize fuel. But on September 25 we entered Lievely Harbor, between five and six in the evening. The natives brought us off ducks and fresh fish in abundance, which we thoroughly appreciated after our long deprivation of fresh food. Mr. Smith, the inspector of north Greenland, told us that the "Pandora" had left for England five days before. A few of the officers obtained letters, which had been brought by the Danish brig from Copenhagen; but we heard with dismay that our letters were at Littleton Island, thirty miles from Cape Isabella, where we had obtained our first despatches.

The weather was glorious during our stay here, and a ramble over the hills clothed in fragrant heather was indeed a treat. We lay down on the turf, and basking in the sun, enjoyed the lovely prospect of the placid sea, in whose waters floated stately bergs, amongst which whales were seen playing and sporting in the sunshine. I visited the school, where I found pretty little children, some with blue eyes and fair hair, who seemed very well-behaved and wrote a fair hand in their copy-books. Having rewarded those mentioned by the schoolmaster with especial praise, I was invited to enter an Esquimaux hovel of the poorer kind, having to crawl on all-fours through a low and dirty tunnel; here I found fifteen or twenty people assembled, the heat from the stove being oppressive. On the floor lay the carcase of a huge seal, which the women were cutting up. After a little conversation with a man who had picked up a few words of English from the whalers, I bid farewell to my friends. But I had not yet done with them. Some pretty girls with jet black hair and eyes and rosy cheeks pursued me, and began to handle my black silk necktie, as a sign that they desired it. I never could refuse anything to ladies, be they Esquimaux, nigger, or English, so the neckerchief speedily changed owners, and a sealskin tobacco-pouch was pressed upon me in return by these pantalooned damsels. The next day we entertained the "Alert's" at dinner in our little ward-room, and were astonished to find it capable of containing all the officers of the expedition. That evening, and on several subsequent ones, we witnessed a magnificent aurora, the bright white lustrous cloud, constantly changing form, and darting rays in all directions, mounting rapidly from the horizon to the zenith, and spanning the ship as a huge bow.

We left Lievely after a stay of two days, and proceeded to Egedesminde, a neighboring settlement, containing a hundred and forty inhabitants. Here we obtained twenty tons of Scotch coal, the Danish brig having left more than sufficient for the use of the inhabitants. The "Alert" had taken in thirty tons at Lievely. Here we remained three days, the men enjoying dancing with the natives in the evenings. The governor showed us much kindness, and he and his family were in their turn

entertained by the ships. He had two beautiful little girls, and their governess, who had come from Copenhagen for three years' stay, was a most elegant and refined young lady. How she could exist with happiness in so desolate a region was more than we could understand.

Within two or three hundred yards of the houses we saw with horror a number of coffins on the ground, most of them broken and decayed, and exposing human skeletons; they were evidently very old, yet portions of clothing still remained in some coffins. I believe that some of our party persuaded the governor to see them decently interred. But there was a modern cemetery at some distance, where the dead are buried in a proper manner.

We left this place on October 2, and soon experienced bad weather again, which accompanied us nearly all the way home. The men had by this time become so thoroughly disgusted with preserved meats that they were unable any longer to eat them, and we gladly presented them with butter, cheese, Swiss milk, soups, and all our private stock that we could spare; it was evidently high time that we got home. On the 16th we came up with the "Pandora," but three days after lost her, and also the "Alert," in a heavy gale, and sighted them no more during the whole voyage. The next day one of our boats, hanging from the davits, was smashed by the sea, and had to be cut adrift. I thought I had never seen the sea so rough.

But at last we got into finer weather, and entered Cork harbor on the 28th of October. A pilot boat came off to us, wishing to take us into Queenstown. Asking from whence we came, a voice was heard to say, "The North Pole," and they were about as wise as before. Our appearance much puzzled them, for in the shabby figures clothed in sealskin and box-cloth, patched with green baize and duffel, they failed to recognize men-of-war's men, mostly so trim and neat. Still they thought the number of officers inconsistent with the merchant service; neither did our white ensign inform them of our real character. Next morning we entered Queenstown, and received an enthusiastic greeting; and as we gazed fondly on the green trees and verdant meadows of home, we felt fortunate and thankful at having brought our voyage to a happy conclusion, and escaped from the hardships and monotony of a second Arctic winter.

A PEASANT PROMETHEUS.

TRANSLATED FOR THE LIVING AGE FROM THE FRENCH OF EMILE SOUVESTRE.

I HAD once a class-mate in Paris, a medical student, who when he graduated (being a Breton) settled down in what has been called the Land's End of France. He went to live at Commana, a little hamlet in the mountains, near the extremity of that peninsula which breasts the full force of the Atlantic Ocean. His nearest town was Quimper, to which there is now a railroad, but no railroad had been even projected in Brittany in that day.

The country in which he lived was more wild, and yet more lovely, more lonely and yet more full of recollections, than any country I have ever been in. Wide moorlands, often divided by great banks and hedgerows (for no purpose one can imagine, since nothing grows in these enclosures but furze, fern, and heather) terminate in cliffs that go sheer down into the ocean. Here and there, like cracks in the brown moorland, are valleys of the loveliest green, with fields of hemp and buckwheat, meadows of rich grass, willow gardens, teeming orchards, and homesteads nestled in great clumps of elms. The shore of the bay is a succession of black cliffs and exquisite small beaches of white sand. The whole terminated by that astonishing place Penmarc'h, or the Torch of the Horse's Head.

Soon after he had settled at Commana, my friend the doctor sent me an invitation to come and stay with him. The travelling public had not then found out the attractions of Brittany, but I was a Breton born, though not from that part of the country.

I went down to Quimper by diligence, whence I hired a horse and guide to take me by peasant tracks over the purple moorland. Near Penmarc'h we passed over the ruins of what in the Middle Ages had been a great commercial city. A city which it is said in history could equip three thousand fighting men, and shelter seven hundred craft in its wide harbor. It was partly destroyed by the English in 1404, and wholly desolated, a century and a quarter later, in the wars of the League.

As I rode over its ruins, fragments of which stuck up like boulders through the purple heath and pale pink pimpernel, my guide said, — even where I could not see a stone, — "This is the goldsmiths' street, — now we are in the smiths' street, — this is the street of the stonemasons."

I grew sad, as I always do when moving

among material ruins, but at Commana I was to see something sadder still, the ruins of a great genius chained by penury and circumstances to the rock of obscurity.

My friend the doctor was very glad to see me, and we spent a happy evening talking about Brittany, a subject always full of matters of discussion to her sons. In the course of conversation the doctor expressed great interest in a carpenter of the neighborhood, who, he told me, was gifted with an extraordinary turn for mechanics.

His rounds upon the morrow lying in the direction where his peasant genius lived, we agreed to go and see him the next morning.

The sun was just gilding the Black Range when we set out; the purple moorland stretched on every side of us, dotted with black sheep under the charge of children, but there was not a trace around of trees, or any verdure. The air we breathed was fresh, pure, and exhilarating, the birds sang gaily in the hidden valleys, the fragrance of some fields of flowering buckwheat, which lay also out of sight, perfumed the morning air. We walked on, chatting gaily, impregnated (if I may use the word) with the delicious freshness of so bright a morning.

When we came in sight of the little hill on which Jahona's house was built, the doctor paused and pointed it out to me. It was made out of a dovecote (a dovecote is a sort of stunted tower in Brittany) newly thatched, with windows broken through the walls at irregular intervals. My friend told me that Jahona's wife, who came of noble blood, had inherited this ruin, with half an acre of land attached to it, and that her husband had transformed it into a dwelling.

As we drew near we saw the master of the house at work before his door. My friend wished him good morning, and entered into conversation. While they were talking I took the opportunity of examining the work he was engaged upon. It was an oaken chest, very rudely executed, by no means corresponding to the idea I had formed of his workmanship. I expressed my disappointment to my friend in French, not supposing that Jahona knew any language except that of Brittany, but by his smile I saw I was understood.

"I do better than that sometimes, monsieur," he said. "But I cannot afford time over this common work, or my five little children would be crying for food. I have been two days already working over that chest, and one cannot get much buckwheat for three francs, you know."

"Are you paid no more for all this work?" I said.

"Those who have to pay always think that labor's dear," he answered, in the sententious manner very common among the peasants of Brittany.

"You must not judge Jahona by a thing like that," explained my friend. "Jahona when he pleases can work like the saints, both fast and well. He has carved nearly every crucifix in the surrounding parishes."

"Do you carve crucifixes too?" I asked the carpenter.

"When I have no oak chests in hand," he replied.

"That is a higher order of labor, surely that is better paid," I cried.

"Not much. I carve by the day's work generally. Sometimes I am paid by the piece — five francs a foot. Some *curés* want the spear and crown of thorns thrown in besides," replied Jahona.

At this moment a clear metallic sound came from the interior of the house, and was repeated seven times successively. I turned round in astonishment.

"That is my clock, monsieur," said the carpenter.

"He made it himself, after studying over the old pendulum affair in my kitchen," said the doctor. "Come in and look at it."

Jahona pulled off his hat, with the politeness never wanting in a peasant of Brittany, and drew back, motioning us towards the door. We entered.

The wife was seated, rocking her baby's cradle, but busy with her spinning. As we came in she rose and bade us welcome, laying aside her distaff and pushing back her wheel. The doctor began talking to her about her children, while Jahona took me up to a sort of wooden coffin fixed up against the wall. It was his clock. He opened the tall door of the pine box, and I gave a cry of wonder, at the sight of the interior.

Having nothing fit to make use of in the construction of a clock, the poor fellow had employed every kind of strange material. Bits of iron, copper, and stone had been worked into his purpose. In the whole clock there were no two scraps of anything that could ever have been expected to come together. Everything had been intended for something else. The clock-face was a large slate. The figures, and some arabesques very well executed, had been scratched upon its surface. The striker, whose clear sound had attracted

my attention, was a bit of a copper basin, struck by a piece of iron with a brass knob, the remains of an old fire shovel. All the rest of the materials were equally incongruous. I was standing in mute astonishment before the case, when some one called Jahona.

"Well, *mon cher*," said the doctor, coming behind me. "What do you think of this thing?"

"It must be an abominable timepiece, but it is a marvellous creation. I am almost afraid to think how much imagination, calculation, skill, and perseverance it must have taken to accomplish it. Your workman has a true genius for mechanical invention."

"There is no telling what he might not have become," said my friend, "had he been born where he had greater opportunities. He made everything you see about you. He fashioned all the furniture, repaired the walls, and thatched his dwelling. He works as well in wood and masonwork, as he does in metal. It is easier to him to invent a thing than to imitate. He has an especial gift for simplifying the conveniences of life. See this lock on his cupboard. There is not a particle of iron in its composition, and yet it is a capital lock. The key you see is made of a big nail and a wooden peg. You know how Breton chimneys smoke — look at his."

I turned towards the hearth. Jahona had gathered together at the back a heap of broken pottery, fragments of great earthen jars used for making lye in Brittany. By this means he had given his fireplace a semicircular form, which concentrated the heat, and increased it by reflection. It was the same idea as that of Count Rumford.

"He must have seen some modern fireplaces," said I to my companion.

"Never," he replied. "So far as I know there is nothing of the kind anywhere in this neighborhood, and Jahona has never been a dozen miles away from his own village. As I tell you, he is a born inventor. Whenever you see anything in this part of the country which strikes you as convenient or ingenious, you may be very sure somebody will tell you, 'That was made by Jahona.' But his inventive talent keeps him poor. Were it not for that he might live very comfortably; that is he might eat bacon on Sunday, and bread every day in the year. But when an inspiration comes upon him he is apt to neglect his every-day work, and disappoint his customers. He studied three years for the priesthood, and acquired the rudiments of Greek and Latin. I pity him profoundly. He must be an unhappy man. He would not tell you so. He may never have found it out, but watch him and you will soon see indications of his hidden struggle."

At this moment Jahona came back, accompanied by a priest, who I perceived at once was one of those (to be found even in Brittany), who rattle off God's work in a mere spirit of business, like a government official entrusted with local affairs.

When he saw us he pulled off his shovel hat and gave a jovial laugh as he accosted the doctor. He told us he had come to look after a statue of the Blessed Virgin which Jahona was carving for his church. He seemed very much annoyed by the unpunctuality of the workman, who had kept him waiting six weeks.

"You must make some allowance for Jahona," I said, "he is a very uncommon man."

"That's true," replied the *curé*, lowering his voice and whispering in my ear. "The poor devil, we all know, is three parts crazy."

Meantime Jahona had been getting out his statue, and brought it to the light for our inspection. He pulled off some coarse wrappings, and we perceived a statue of the Virgin nearly completed.

My first feeling was one of very great surprise. My idea of the Virgin Mother had till that moment never been dissociated from certain Raphaelesque forms, and I could hardly recognize her in this statue of Jahona.

I expected to see as usual a young girl with downcast eyes, holding a naked, smiling infant in her arms. But when I had got over my first surprise, and began to examine the work carefully, the idea impressed itself upon me.

The mother of our Lord was seated in a position that expressed profound depression. The babe was sleeping on his mother's breast, but his face was entirely concealed from the spectator. The Virgin's face was full of sadness and anxiety. She pressed the infant to her heart with a convulsive movement, as if protecting him from some great peril. In spite of her depression and her look of care, a simple loving-kindliness beamed from her features. Her attitude was true to nature, though devoid of grace. The statue bore the stamp of Brittany, and that impression was completed by the costume. She was dressed as a peasant woman of that part of the country.

I stood looking in astonishment at this new conception of the Virgin. I had seen many statues of the mother of Jesus — but till now I had seen no statue of the mother of the Redeemer.

It was the Virgin Mary overwhelmed by a sense of the dignity of her own offspring,— the child whom she had borne, — both God and man. It was the Virgin Mary face to face with the great mystery with which she was associated, with the sword piercing her own soul as she contemplated her son's fate and her own agony. It was a Virgin Mary whose woman's feelings made her shrink from the unknown, and made her for a moment oblivious of her divine mission, as she gazed into the darkness of the future, and beheld the great dim cross making ready for our redemption — the Virgin with a mother's instincts stirring in her heart, as she thought of the coming sacrifice of her beloved son.

It was not the usual Virgin, calmly glorious in a sweet consciousness of her divine maternity — it was a sad and troubled woman laden with cares and fears, the true type of peasant womanhood.

I was absorbed in the suggestions of this work, when the priest, who had been joking with my friend, came up and stood beside me.

"Well, monsieur," he said, "and what is your opinion?"

I could not answer him immediately. He began to examine it more closely.

"Why, what's the reason," he cried out, "that you have given the Blessed Virgin such a dismal look, Jahona?"

"I am sorry, *monsieur le recteur*, if it does not please you; but when the infant Jesus was that age the Blessed Virgin was escaping from the massacre of the innocents, and was afraid of King Herod."

I had not thought of this, which gave the statue a new charm of historical verity. The priest however did not see it so.

"What matter for that?" he said. "You ought to have made her smile, as she always does in pictures. Was not the Virgin a mother above everything?"

"Yes — *mater dolorosa*," murmured Jahona, with a peculiar smile.

"And the child Jesus," said the priest. "One can't see what his face is like, all muffled up in that way. Why didn't you let us see his face, Jahona?"

"Because I did not know how to make the face of the Son of God."

The priest shrugged his shoulders; then looking at the statue he resumed, —

"Well! luckily the house-painters are coming to paint our church in a month or two. A little paint will do wonders for your statue. We'll dress the Blessed Virgin in bright colors, and make her smile in spite of the massacre of the innocents!"

He laughed at his own wit, which he seemed to consider capital; and after directing Jahona to get it done as soon as possible, went away.

We staid on, talking with the artist, who showed us several half-finished carvings. We were just leaving when my eyes fell on a great lot of thick oak planks which I had noticed when I first came in, and which seemed to be intended for some kind of building or carpentry.

"What are those?" I asked Jahona.

He hesitated a little, and replied, —

"Part of a windmill."

"What! you build windmills too?" I exclaimed.

"He wants to build one for himself," said my friend, laughing. "Jahona wants to transform his dovecote into a windmill. There are not enough mills in this neighborhood to supply the wants of the inhabitants. Jahona is quite right in thinking that if he could build one he might make it very profitable. Unhappily time and money have been wanting thus far, though he began his mill long ago."

"Seven years ago this month, monsieur," said Jahona, "seven years ago!"

"Have you made much progress?"

His face assumed its saddest look, as he answered slowly, —

"I finished it all last year. I had nothing to get except the millstones. But the winter was very severe. There was no work, and fuel is scarce in this neighborhood. My good wife burnt up some of my mill to warm the poor little ones who were crying with cold. I had to begin all over again."

"You were not discouraged?"

"No, — if it should take another seven years, I mean to have my windmill. Long as the road is between Quimper and Commana, a child may walk it, just by putting one little foot — step after step — before the other."

"Have you never had any wish to leave your native place?" I said. "You might find that in some of the cities your genius, if recognized, might make you rich much sooner than here."

He shook his head.

"Money is seldom found where people go to look for it," he said quietly. "Good luck is where God means it to be found. The happy lark picks up her little grain

as often in the fields as in the courtyard of the *château*."

"But don't you sometimes feel sorry that you have never risen to be more than a country workman? Are you not grieved when you have finished anything as fine as your carving of the Virgin, to have people come here and tell you it is bad?"

Jahona shrugged his shoulders and smiled, but I thought his smile was very sad.

"Those who pay have a right to find fault, monsieur," he answered.

I cannot describe how his brave words affected me.

We left the house, and when we had gone a few yards we turned and looked behind us.

Jahona was standing outside his tall cottage looking up at it with an expression in his face, as if he saw in "his mind's eye" the great white sails of his windmill turning slowly in the air.

Our eyes met, and he saw I knew what he was thinking.

"Yes, monsieur," he said, smiling, "one of these days I make sure of seeing four strong arms up yonder doing my work for me,—great arms of oak and canvas which will work, and not grow weary; and when that comes to pass I shall live at my ease for the future. I shall be able to think and plan in peace without having my customers displeased because I have not finished the work I promised them. A miller's life is a very easy one. So long as he hears his sails creak he may make himself contented. The wind of the good Master is providing his daily bread. If you ever come back into this neighborhood, monsieur, and catch a glimpse from the hills yonder of four sails revolving in this direction, you may safely say, 'There lives a man who has nothing more to ask from the kind hand of his Heavenly Father.'"

After saying these words with a sort of rustic elegance, and great depth of feeling, Jahona took off his broad hat, and went back into his dwelling.

"Well!" said my friend the doctor, when we had gone a little way, "what do you think of him?"

"That he is a great genius, whose powers will result in nothing, alas! but a bad timepiece and a windmill."

"Provided he ever builds his mill," said my companion.

"Why shouldn't he build his windmill?"

"He has disease of the heart, but does not know it," replied the doctor. "In eighteen months from now he will be dead, and will never have finished his windmill."

I stopped short, with a sharp cry, and gave a frightened glance back at the curious cottage.

Its poor proprietor had again come out, and stood before his door, looking upward with a smile, and his three little children were playing on the threshold.

From The Spectator.

POETRY AND CIVILIZATION.

LORD MACAULAY thought he had proved that as civilization grew, poetry must decline. But that, we take it, is a delusion of the same type as those which beset men as they grow old, and make them dream that it is the world at large which is losing its vivacity and freshness, and not their own individual life. We can, to some extent, understand the fear which Mr. Ruskin and others cherish that civilization and its mechanism are dangerously invading the field of true art. It is quite true, we take it, that the sphere of art is the sphere of free and pliant life, and that the factory, the engine, the machine, and all that the factory, the engine, and the machine produce, in bearing the impress of a strict and iron rule, exclude the free creative beauty which is the very life of art. But the same fear has really no application to poetry. Its sphere is so wide that as long as the will is free and the affections of man are fresh, there need be no fear in the world for any narrowing of the sphere of poetry. In the minutest crevices between the most rigid mechanism of life, poetry can grow as easily as the flower between the angles of a wall, or a swallow, destined to range the seas and migrate to the delights of an African winter, in the grim niches of a London chimney. The fears which periodically send a shiver through society lest the fountains of poetry be dried up, are only the hallucinations of men whose own imaginations are growing cold, and unable to enter into the vividness of the last breath that has stirred the hearts of men. In the growing complexity of life, there is, we think, a reason why poetry is likely to treat subjects of less massiveness and sublimity than of old, or, when it deals with subjects of a massive and sublime order, why it should be very apt to go back to the old days when life was large and simple, and no longer broken up into so many minute cells of separate interest and significance. But no one can really look carefully into the

literature of the day, and doubt that it is not the want of poetic subjects, but only the rarity of the minds fitted to treat those subjects poetically which limits our poetry; nor, again, that there have been few periods, — except those rare periods of poetical productiveness, when nations have seemed to discover in themselves a new energy and freedom and a new gift of speech for translating it into words, — when there have been, even relatively to the increasing number of the inarticulate masses, so many endowed with some poetic gifts, and able so to sing, that men delight to hear them, and live more genuinely for hearing them.

Here, for instance, lies before us a new illustration of the adaptation of the present age for poetry, whenever it can produce a living interpreter of its wants and feelings and perceptions. We refer to a little volume * of poems by Edward Dowden, which has just appeared, and which, we venture to say, no true critic will read through without discovering in it, in greater or less degree, according to the measure of his own faculty, the criteria of true poetry, nor yet without acknowledging that it is poetry which has sprung straight out of the very surface of modern thoughts and emotions. Mr. Dowden is, we believe, himself a fine critic. At all events, he is deeply saturated with all the currents of thought most familiar to our modern critics. Poetically, we should speak of him as formed in the school of Wordsworth, amongst whose very finest sonnets some of Mr. Dowden's might well be classed, without the separate origin of the authorship being discovered by any one who judged by internal evidence only. But this is not surprising, for Wordsworth has entered thus vitally into all the more thoughtful minds of our day. His mode of appreciating nature has educated modern England, till it has become almost a mark of alien culture not merely not to understand his poems, but not to speak his peculiar language. Again, Mr. Dowden has entered deeply into all the speculative questions which are of far later origin than the Wordsworthian age. "Darwinism" haunts him in his poetic reverie; he has sounded the weakness of democracy, and yet has a secret admiration for the naked power of the people's will; he studies the attitudes of Eastern fanaticism with the same kind of deep speculative interest with which he describes the gambols of the swallows; with the true modern eye for what is characteristic whether of spiritual or natural states, he paints with equal care the spinning dervish and the prim fledgings of the swallow's nest; again, from the intensity of that deep and dreamy devotion which is natural to a metaphysical age, he carries us into the strait and frigid conventionalism of the modern young lady's *savoir-faire;* and last, though not least, with the delight of the present day of complex interests in the large and simple subjects of ancient legend, he treats a certain number of the great classical themes in the mode most natural to a modern who appreciates perfectly the antique point of view, but reflects it with all the special emphasis of one who at heart contrasts it with a very different modern view, of which the ancient world knew nothing. In all these various regions Mr. Dowden shows a true poetic touch, which we do not say will win him a permanent place in English literature, — for that he must do more and loom larger on the mind of the present distracted generation than this little volume would accomplish for him, — but which we do venture to say is of the *kind* to win him such a place, if he can produce more volumes as pure and rare and delicate in flavor as this is. Take, for instance, this delicate sonnet on "Ascetic Nature," suggested by a most characteristic Irish scene: —

Passion and song, and the adornèd hours
Of floral loveliness, hopes grown most sweet,
And generous patience in the ripening heat,
A mother's bosom, a bride's face of flowers,
— Knows nature aught so fair? Witness, ye powers
Which rule the virgin heart of this retreat
To rarer issues, ye who render meet
Earth, purged and pure, for gracious heavenly dowers!
The luminous pale lake, the pearl-grey sky,
The wave that gravely murmurs meek desires,
The abashed yet lit expectance of the whole,
— These and their beauty speak of earthly fires
Long quenched, clear aims, deliberate sanctity, —
O'er the white forehead lo! the aureole.

No one not a true poet could have written that line, "The abashed yet lit expectance of the whole." It is a line condensing a whole world of observation and emotion into one exquisite phrase. How true, too, is the appreciation of the most perfect phase of Irish scenery in this sonnet, — that subdued and pale, not to say pallid lustre, which seems to borrow something from "the melancholy ocean," but much

* Henry S. King & Co.

more from the self-refraining nature which will not merge in the creature the fulness of the heart that should be given to the Creator. Again, would not Wordsworth himself have felt his heart bound with the same kind of proud exultation which he felt when he had written such a sonnet as the grand one on Toussaint l'Ouverture for instance, if he had conceived the following, concerning the fear that when the heart has gained all in gaining God, it may lose him again by the mere intrinsic feebleness of its own wasting powers? —

LIFE'S GAIN.

"Now having gained Life's gain, how hold it fast?
The harder task! because the world is still
The world, and days creep slow, and wear the will,
And Custom, gendering in the heart's blind waste,
Brings forth a wingèd mist, which with no haste
Upcircling the steep air, and charged with ill,
Blots all our shining heights adorable,
And leaves slain Faith, slain Hope, slain Love the last."
O shallow lore of life! He who hath won
Life's gain doth hold nought fast, who could hold all,
Holden himself of strong, immortal powers.
The stars accept him; for his sake the sun
Has sworn in heaven an oath memorial;
Around his feet stoop the obsequious hours.

These four last lines, in the exaltation of their claim that God and all his creatures conspire to strengthen the man who has won the eternal for his own, may fairly be placed — nor will they lose by the comparison — with the grand lines in which Wordsworth assured the negro patriot of the powers which would sustain him even in the "deep dungeon's earless den:" —

Live and take comfort. Thou hast left behind
Powers that will work for thee — air, earth, skies;
There's not a breathing of the common wind
That will forget thee; thou hast great allies;
Thy friends are exultations, agonies,
And love, and man's unconquerable mind.

Again, to show how Mr. Dowden appreciates the world of limitation and convention which is bred of modern frivolity and fashion, take the fine sonnet alluding to the anger felt by David against Michal for laughing at the Oriental passion of his dance before the ark: —

DAVID AND MICHAL (2 Samuel vi. 16).

But then you don't mean really what you say —
To hear this from the sweetest little lips,
O'er which each pretty word daintily trips
Like small birds hopping down a garden way,
When I had given my soul full scope to play
For once before her in the Orphic style
Caught from three several volumes of Carlyle,
And undivulged before this very day!
O young men of our earnest school confess
How it is deeply, darkly tragical
To find the feminine souls we would adore
So full of sense, so versed in worldly lore,
So deaf to the eternal silences,
So unbelieving, so conventional.

Or for the mixture of sympathy with nature and the humor of its glance at human society of the religiously conventional kind, take the following graceful verses entitled, "In the Cathedral Close:" —

In the dean's porch a nest of clay
With five small tenants may be seen,
Five solemn faces, each as wise
As though its owner were a dean;

Five downy fledglings in a row,
Packed close as in an antique pew
The schoolgirls are, whose foreheads clear
At the *Venite* shine on you.

Day after day the swallows sit
With scarce a stir, with scarce a sound,
But dreaming and digesting much,
They grow thus wise and soft and round.

They watch the canons come to dine,
And hear the mullion-bars across,
Over the fragrant fruit and wine,
Deep talk about the reredos.

Her hands with field-flowers drench'd, a child
Leaps past in wind-blown dress and hair,
The swallows turn their heads askew, —
Five judges deem that she is fair.

Prelusive touches sound within,
Straightway they recognize the sign,
And, blandly nodding, they approve
The minuet of Rubenstein.

They mark the cousins' schoolboy talk,
(Male birds flown wide from minster bell),
And blink at each broad term of art,
Binomial or bicycle.

Ah! downy young ones, soft and warm,
Doth such a stillness mask from sight
Such swiftness? can such peace conceal
Passion and ecstasy of flight?

Yet somewhere 'mid your Eastern suns,
Under a white Greek architrave
At morn, or when the shaft of fire
Lies large upon the India wave,

A sense of something dear gone by
Will stir, strange longings thrill the heart
For a small world embowered and close,
Of which ye some time were a part.

The dew-drench'd flowers, the child's glad eyes,
Your joy unhuman shall control,
And in your wings a light and wind
Shall move from the maestro's soul.

The passages we have given are but specimens, and we will venture to say by no means exceptional specimens, of the poetry in Mr. Dowden's charming little volume. In fact, nothing we have given approaches in intensity some of the "New Hymns for Solitude," or in picturesqueness some of the modern studies from the antique, say, for instance, the very fine lines on Helen or on Andromeda. But what we have given is, we take it, quite sufficient to dispel the fear of any one who should be sufficiently faint-hearted to apprehend that modern civilization has any tendency to extinguish poetry, — nay, that it does not create at least as many poetical points of view as it tends to hide. A highly complex world will certainly be relatively deficient in massive and simple situations and groups, but it will be relatively abundant in those spiritual attitudes of the soul out of which the poetical impulse flows at least as freely as out of grand situations and heroic forms.

From Chambers' Journal.

ABSENCE OF WHITE COLOR IN ANIMALS.

SOME very curious physiological facts bearing upon the presence or absence of white colors in the higher animals have lately been adduced by Dr. Ogle. It has been found that a colored or dark pigment in the olfactory region of the nostrils is essential to perfect smell, and this pigment is rarely deficient except when the whole animal is pure white. In these cases the creature is almost without smell or taste. This, Dr. Ogle believes, explains the curious case of the pigs in Virginia adduced by Mr. Darwin, white pigs being poisoned by a poisonous root which does not affect black pigs. Mr. Darwin imputed this to a constitutional difference accompanying the dark color which rendered what was poisonous to the white-colored animals quite innocuous to the black. Dr. Ogle however observes, that there is no proof that the black pigs eat the root, and he believes the more probable explanation to be that it is distasteful to them, while the white pigs, being deficient in smell and taste, eat it and are killed. Analogous facts occur in several distinct families. White sheep are killed in the Tarentino by eating *Hypericum criscum*, while black sheep escape; white rhinoceroses are said to perish from eating *Euphorbia candelabrum;* and white horses are said to suffer from poisonous food where colored ones escape. Now it is very improbable that a constitutional immunity from poisoning by so many distinct plants should in the case of such widely different animals be always correlated with the same difference of color; but the facts are readily understood if the senses of smell and taste are dependent on the presence of a pigment which is deficient in wholly white animals. The explanation has, however, been carried a step further, by experiments shewing that the absorption of odors by dead matter, such as clothing, is greatly affected by color, black being the most powerful absorbent, then blue, red, yellow, and lastly white. We have here a physical cause for the sense-inferiority of totally white animals which may account for their rarity in nature. For few, if any, wild animals are wholly white. The head, the face, or at least the muzzle or the nose, are generally black. The ears and eyes are also often black; and there is reason to believe that dark pigment is essential to good hearing, as it certainly is to perfect vision. We can therefore understand why white cats with blue eyes are so often deaf — a peculiarity we notice more readily than their deficiency of smell or taste. — DR. WALLACE, *British Association*, 1876.

MR. GLADSTONE ON THE STUDY OF HISTORY. — The *Liverpool Albion* says that "A Young Liberal" having written to Mr. Gladstone asking him to furnish a list of books the best calculated in his opinion to supply a knowledge of history bearing upon political questions of the present time, has received the following reply: "Sir, — Among the books you might read with advantage are 'Green's Popular History of England,' 'Hallam's Constitutional History of England,' 'Ranke's History of England,' 'Guizot's History of the Great Rebellion,' 'Sir E. May's Parliamentary History of England.' These works are generally free from the spirit of partisanship. But let me observe that no one can effectually study history for present purposes without also examining into the accounts of other countries and of ancient times. — Your faithful servant, W. E. GLADSTONE."